TECNO CANAPA

GREEN BUILDING

PRODUCT RANGE

SENINI

INDEX

SENINI

ECO-EN VIRON MENT SENINI

ECO-FRIENDLY

Healthy, Beautiful and People-oriented

Senini is enriched with a new product range for the green building sector:

HEMP-AND-LIME BLOCK.

A modern choice, coherent with the strategy of the company which for many years has been committing to the production of innovative and eco-friendly materials.

Homes of the future will be built more and more with natural materials: this is a fast-growing tendency that will help to preserve the environment and provide a better quality of life. That's why Senini is offering high potential materials which fascinating history will contribute to innovate the future of construction becoming real protagonists.

UNI EN ISO 9001
ICMQ
Certificazione sistema qualità

UNI EN ISO 14001
ICMQ
Certificazione ambientale

BUILD THE FUTURE

HEMP & LIME

Building materials
of the
Third Millennium

Natural Resources

Scientific Research

Technology

The new range of hemp-and-lime products represent the evolution of the construction sector since the materials are energy-efficient, natural and sustainable.
This building system is already well-established even in italy, where we've set up the largest hemp-and-lime blocks manufacturing plant. This technique is currently achieving the market while including larger buildings.

THE USE OF HEMP IN CONSTRUCTION IS REALLY ANCIENT.
Its long-lasting characteristics were already known 1500 years ago. It has been confirmed by the discovery of many examples of centenary works.
Amongst others, a bridge built 1500 years ago with a conglomerate of hemp and lime has been found by archaeologists in the south of France.

LIME IS A TRADITIONAL MATERIAL, PROTAGONIST IN THE EVOLUTION OF CONSTRUCTION AND ARCHITECTURE
The oldest known artefact made with lime dates back to 7000 BC. Lime is obtained by heating limestone, a commonly-found type of rock. It has a very long life cycle and can be considered as the building binder of the third millennium due to its intrinsic characteristics of healthiness and resistance.

The use of the compound by peoples and civilisations throughout history is proof of the constructive value of hemp and lime. Today it is confirmed by the scientific recognition of Universities and Research Centres in Italy, France, United States, Canada, Germany and England.

HEMP & LIME

The mixture of hemp, water and lime creates an ideal product for use in green building

The high silica content of hemp shiv - the woody part of the plant – combined to the magnesium of the natural lime, activates the carbonation of the material and the hardening of the fibres. Once the compound is dried, it becomes rigid, very resistant and durable while being light and elastic.

HEMP SHIV
The ligneous part of the hemp plant

+

WATER

+

PROBIOTICS

+

LIME
natural binder

THE EVAPORATION OF WATER CAUSES A CHANGE OF STATE.
The lime mineralises
the natural component of the hemp shiv.

» MINERAL

The compound consolidates within a few hours and this petrification process keep going until it acquires a consistency similar to stone.

» APPLICATIONS

The blocks of hemp and lime, combined with a load-bearing structure in wood, steel or reinforced concrete, can be used for different structural and thermal purposes whether for private, commercial or industrial construction.
Hemp-and-lime masonry does not require cladding panels, insulating panels or vapour barriers.

» IT IS USED FOR:

- **Construction of insulating masonry for the building envelope**
- **Building recovery: renovations, restorations**
- **Internal/external wall insulation system for existing buildings**

SIMPLE materials, employed for **CENTURIES**, combined to the **TECHNOLOGY** for

GREEN BUILDING

1 ECO-FRIENDLY
THE ENVIRONMENT IS GRATEFUL

The hemp and lime mixture correspond to a high standard of environmental sustainability. Hemp has a very fast life cycle, it's an extremely resistant plant, needs little water, grows without fertilisers, pesticides and herbicides. Furthermore, it enhances the soil by assimilating pollutants and has a great ability to absorb carbon dioxide by releasing oxygen (4 times more efficient than other plants). Lime is a natural material obtained by crushing limestones which are very widespread throughout the Italian territory.

2 DURABILITY
TIMEPROOF BUILDINGS

Hemp-and-lime buildings are not affected by oxidation or external agents and can last almost forever. The Ellora Caves, built in India in 600AD are the best example of the preservation capacity of the hemp-and-lime mix since it has protected and preserved for hundreds of years the precious paintings of the archaeological site that is now part of the UNESCO World Heritage.

3 MECHANICAL RESISTANCE
LIGHTNESS IS ITS STRENGTH

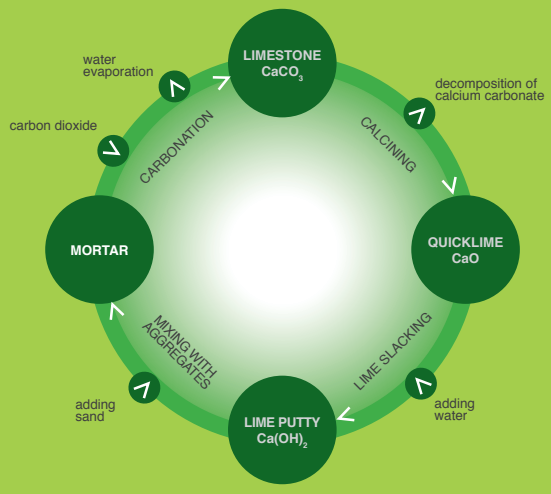
Buildings made of hemp fibre materials are very resistant to dynamic stresses because they are able to absorb vibrations. They are definitely suitable for use in seismic areas.

4 RECYCLING
ENDLESS LIFE

At the end of its life cycle, the biocomposite of hemp and lime is totally biodegradable and reusable in accordance with the current practices of environmental protection, sustainability and energy saving.

5 CARBON NEGATIVE
THE FIRST BUILDING MATERIAL WITH A NEGATIVE CARBON FOOTPRINT

The complete production cycle of the hemp and lime block results in low CO_2 emissions. According to a Life Cycle Assessment made by the *Politecnico di Milano*, each cubic meter of this material installed has captured up to 60kg more CO_2 than total gas emission during its production, transport and installation on site.



THE HOUSE THAT BREATHES

6 LIVING COMFORT

CONSTANT LEVELS OF TEMPERATURE AND HUMIDITY

Thanks to the hygroscopic capacity of hemp and the vapour permeability of lime, the biocomposite is able to absorb and regulate the level of humidity inside the buildings. This prevents the formation of dew points, the proliferation of microorganisms, condensation, mould and the internal deterioration of the material. The purified air provides a pleasant and healthy living atmosphere. It also has good soundproofing characteristics which improve the acoustics inside the rooms.

7 THERMAL INSULATION LAMBDA 0,07

OVER THE STANDARD

Hemp is an excellent natural insulator which is able to control sudden changes in temperature. It has a good insulation capability during winter and protects from heat in summer. The biocomposite cancels thermal bridges and increases the airtightness of the building.

8 PROTECTION AGAINST FIRE

AND INFESTATIONS

Once mineralised by the lime, the hemp becomes fireproof and protects the walls from insects and rodents. Lime has always been used to maintain hygiene and avoid infestations.

9 ENERGY SAVING

FOR NEW AND EXISTING BUILDINGS

The remarkable thermal insulation performance reduces the energy needs. A building built with hemp-and-lime blocks guarantees **energy savings that can reach up to 90-100% if compared to another one that was built with traditional systems.**

10 ECO-FRIENDLY AESTHETICS

The versatility of hemp-and-lime biocomposites allows you to customise each intervention and satisfy the insulation objectives while considering the aesthetic aspects.

TECNO
CANAPA
GREEN BUILDING

BUILD **DIFFERENTLY**

Tecnocanapa is a high-performing range of solutions for the building envelope made of natural and sustainable materials that provide high energy efficiency and maximum healthiness. It fully meets the requirements for sustainable development: minimising the environmental impact during the production phase of the material, during the building phase and for the entire lifetime of the building.

TECHNICAL PERFORMANCES AND **ENVIRONMENTAL** SUSTAINABILITY

eco-friendly

durable

100% recyclable

100% biodegradable

carbon negative

living comfort

soundproof

high thermal insulation

fireproof

energy saving

HEMP BLOCK

BLOCCO® AMBIENTE

Blocco Ambiente® is a unique material that combines insulation and thermal mass properties.
It is composed of a patented blend of hemp shiv (certified CenC), hydrated dolomitic lime and probiotics.

Respecting the principles of social and environmental sustainability, it has all the characteristics required of a building material in line with sustainable development: high insulating capacity, low embodied energy and the ability to absorb CO_2 from the atmosphere.

CHARACTERISTICS

- Thermal, acoustic and hygrometric comfort.
- Blocco Ambiente® is breathable (vapour permeable).
- Resistant to fire, frost, insects and rodents.
- Low embodied energy.
- Recyclable.

APPLICATIONS

- Construction of insulating and breathable masonry walls.
- External wall insulation system for existing buildings.
- Internal wall insulation system for existing buildings.
- Solid floor insulation.
- Internal partitions with acoustic insulation.

LAYING

- The blocks are laid in a thin bed of mortar composed of hemp and lime according to the proportions indicated in the installation manual
- A handsaw, reciprocating saw or alligator saw can be used to cut the blocks.
- Internal surfaces and partition walls can be coated with sand and lime mortar, clay, gypsum or other breathable finishes.
- External surfaces can be left exposed or can be coated with breathable finishes.

NB. [height] +/- 1 cm	**BA8**	**BA12**	**BA25**	**BA30**	**BA36**	**BA40**	**BA50**
Sizes - Length, Thickness, Height - cm	50x8x20	50x12x20	50x25x20	50x30x20	40x36x20	36x40x20	30x50x20
Density - Kg/m³ dry	330	330	330	330	330	330	330
Conductivity - W/mk LAMBDA λ	0,07	0,07	0,07	0,07	0,07	0,07	0,07
Transmittance - W/m²K U	0,76	0,53	0,27	0,22	0,19	0,17	0,14
Thermal offset without plaster	3h 09'	5h 53'	14h 48'	18h 13'	22h 19'	25h 04'	31h 55'
Specific heat capacity - J/KgK	1280	1280	1280	1280	1280	1280	1280
Vapour permeability - μ	μ = 4,5	μ = 4,5	μ = 4,5	μ = 4,5	μ = 4,5	μ = 4,5	μ = 4,5
Sound absorption coefficient (aw)	1 - CLASSE A	1 - CLASSE A	1 - CLASSE A	1 - CLASSE A	1 - CLASSE A	1 - CLASSE A	1 - CLASSE A
Soundproofing index (Rw) - dB						43	
Compressive strength - N/mm²	0,4	0,4	0,4	0,4	0,4	0,4	0,4
Shear traction with rawlplug - kN	2,067	2,067	2,067	2,067	2,067	2,067	2,067
Orthogonal traction with rawlplug - kN	2,734	2,734	2,734	2,734	2,734	2,734	2,734
Reaction to fire with plaster	B - s1, d0	B - s1, d0	B - s1, d0	B - s1, d0	B - s1, d0	B - s1, d0	B - s1, d0

BIOBETON®

BioBeton® is a low-density hemp and lime biocomposite that combines properties of insulation and thermal mass.
It is composed of a patented blend of hemp shiv (certified CenC), hydrated dolomitic lime and probiotics.
Respecting the principles of social and environmental sustainability, it has all the characteristics required of a building material in line with sustainable development: high insulating capacity, low embodied energy and the ability to absorb CO_2 from the atmosphere.

CHARACTERISTICS

- Thermal, acoustic and hygrometric comfort, BioBeton® is breathable (vapour permeable).
- Resistant to fire, frost, insects and rodents.
- Absence of toxic fumes in case of fire.
- Low embodied energy.
- Recyclable.

APPLICATIONS

- Insulation of roofs, attics and lofts.
- Construction of insulating and breathable masonry walls.
- External wall insulation system for existing buildings.
- Internal wall insulation system for existing buildings.
- Subfloor insulation.

LAYING

- The product is laid by casting it onto roof, floor screeds, attic, subfloor or into formwork.
- The product is delivered already mixed and ready for use in 2 cubic meter Big Bags.

BIOBETON® 200

Thickness - cm		10	15	20	30	40
Density - Kg/m³ dry		175	175	175	175	175
Thermal Conductivity - W/mk	LAMBDA λ	0,053	0,053	0,053	0,053	0,053
K thermal Transmittance - W/mqK	U	0,49	0,33	0,25	0,17	0,13
Vapour permeability - μ		2,8 ≤ μ ≤ 3,5	2,8 ≤ μ ≤ 3,5	2,8 ≤ μ ≤ 3,5	2,8 ≤ μ ≤ 3,5	2,8 ≤ μ ≤ 3,5
Specific heat capacity - J/KgK		1480	1480	1480	1480	1480
Compression behaviour (tension at 10%) - kPa		71	71	71	71	71
Thermal offset (according to ISO 13786)		3h 40’	6h 20’	9h	14h 30’	20h
Soundproofing index when placed on a wooden floor (Rw) - dB				40		
Soundproofing index when spayed 28cm thick on 12cm of brick including internal/external coating (Rw) - dB					56	
Reaction to fire with gypsum fibreboards		A1 En 13501-1 Classe I	A1 En 13501-1 Classe I	A1 En 13501-1 Classe I	A1 En 13501-1 Classe I	A1 En 13501-1 Classe I

THICK HEMP SHIV 0-25

CANAPULO GROSSO 0-25

AVAILABLE IN **20KG BAG**

'Canapulo Grosso' is obtained by mechanical scutching of hemp bales and subsequent shredding of the stems. 'Canapulo Grosso' is produced with hemp that is cultivated, processed and packaged from selected and certified seeds in accordance with European legislation on the content of Δ-9-THC.

USE AND APPLICATION

Preparation on site of BioBeton®, Natural Beton® or 'Malta di Allettamento' by premixing with the natural binder 'Legante Dolomitico Naturale'.

THIN HEMP SHIV 0-6

CANAPULO FINE 0-6

AVAILABLE IN **20KG BAG**

'Canapulo Grosso' is obtained by mechanical scutching of hemp bales and subsequent shredding of the stems. 'Canapulo Grosso' is produced with hemp that is cultivated, processed and packaged from selected and certified seeds in accordance with European legislation on the content of Δ-9-THC.

USE AND APPLICATION

Preparation on site of BioBeton®, Natural Beton® or 'Malta di Allettamento' by premixing with the natural binder 'Legante Dolomitico Naturale'.

NATURAL DOLOMITIC BINDER

LEGANTE DOLOMITICO NATURALE

AVAILABLE IN **25KG BAG**

'Legante Dolomitico Naturale' is a natural binder without chemical or cement additives, meant for the preparation on site of biocomposites belonging to the BioBeton® line by Senini, suitable for the restoration of historic buildings, renovations, new buildings and for the emerging need to build 'Nearly Zero-Energy Buildings' known as NZEB.

USE AND APPLICATION

Acts as a binder in the production of bedding mortar and for insulation systems of : masonry walls, external/internal walls, roofs, attics and subfloors. It's also used for base and finish coating systems.

BEDDING MORTAR

MALTA DI ALLETTAMENTO

AVAILABLE IN **20LT BUCKETS**

'Malta di allettamento' is a ready-to-use low-density bedding mortar based on fine hemp shiv 0-6mm and dolomitic lime putty. Ideal for insulating masonry walls of hemp-and-lime Blocco Ambiente® with the objective of obtaining a high-performance monolithic masonry.

USE AND APPLICATION

Mortar to be used for bedding by applying a thickness from 0.5 to 2.0 cm.
Also used for repointing and tooling the joints of Blocco Ambiente® masonry walls.

NATURAL LIME PLASTER

INTONACO DI CALCE NATURALE

AVAILABLE IN **25KG BAG**

'Intonaco di Calce Naturale' is a special plaster made of natural hydraulic lime, designed for application on hemp-and-lime walls in order to guarantee the best performance.
Its specific formula makes it highly permeable to water vapour. Its properties make it ideal for protection, filling, rendering, base coating and rustic finishes. Also suitable for new or old walls for both internal and external. Thanks to its characteristics and natural colour, it is particularly compatible for use on historical and artistic buildings as well as for green building.

USE AND APPLICATION

Carrying out of base coating or rustic finishes. Used as a traditional plaster, it is mixed with water according to the methods indicated in the technical data sheet.

FINE MORTAR OF LIME PUTTY AND SAND

MALTA FINE DI GRASSELLO E SABBIA

AVAILABLE IN **25KG BAG**

Fine Mortar is a ready-to-use smoothing compound composed of lime putty and classified sands. Its high permeability to the diffusion of water vapour makes it highly compatible with masonry or insulation packages of hemp-and-lime Blocco Ambiente® and Natural Beton®.

USE AND APPLICATION

Smooth finish coating for interiors to be used on 'Natural Lime Plaster' base coat. Apply with a metal spatula with a maximum thickness of 3mm on fresh or previously moistened plaster.

NATURAL BREATHABLE SETTING COAT +

STABILITURA NATURALE TRASPIRANTE PLUS

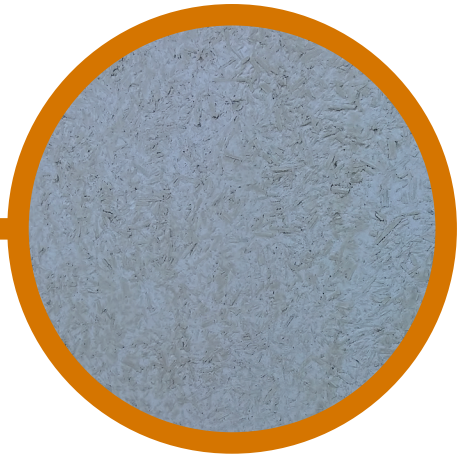
AVAILABLE IN **25KG BAG**

'Stabilitura Naturale Traspirante plus' is a fiber-reinforced mineral skim coat based on natural hydraulic lime NHL 2, specially designed for the protection of external plasters. Its high permeability to water vapour makes it totally compatible with masonry or insulation packages of hemp-and-lime Blocco Ambiente® and Natural Beton®.

USE AND APPLICATION

Used for outer skim coating by applying it on 'Natural Lime Plaster' substrates. Mix with water and apply according to the methods indicated in the technical data sheet. Suitable for obtaining surface finishes with a sponged setting coat.

NATURAL BETON® 500 VENEZIA



AVAILABLE IN **20LT BUCKETS**

Natural Beton® 500 Venezia is a highly breathable natural thermal coating composed solely of Fine Hemp Shiv, Natural Dolomitic Binder and Symbiotic Microorganisms. The total absence of hydraulic binders and mineral aggregates in addition to the high cellulose component maximise the breathability of the masonry and make Natural Beton® 500 'Venezia' the ideal solution for the restoration of masonry even in the presence of rising damp and salt efflorescence. With high energetic efficiency, it is an excellent humidity regulator for new and existing walls, guarantees maximum healthiness and significantly improves the comfort of the living space.

Thickness - cm	3	5
Density - Kg/m³ dry	500	500
Thermal Conductivity - W/mK	0,12	0,12
Thermal Transmittance - W/m²K	2,38	1,70
Vapour permeability - μ	2,7	2,7
Specific heat capacity - J/kgK	1330	1330
Thermal Offset (according to ISO 13786)	0h 30'	1h 30'
Bending strength - N/mm²	0,8	0,8
Compressive strength - N/mm²	1,4	1,4
Adhesive strength to the substrate - N/mm²	0,02	0,02

USE AND APPLICATION

Ready-to-use product to be applied manually with a trowel. Before application, remove the existing damaged plaster and make sure that the substrate is free of friable parts, saline efflorescence, mould, dirt or any element that could affect adhesion. Apply a first coat of Natural Beton® 500 Venezia by patching it on the masonry and then apply the second coat for a constant thickness of minimum 2cm, level off with straightedge and trowel. Natural Beton® 500 Venezia can be finished leaving the Fine Hemp Shiv exposed (textured finish) or coated with a 'Fine Mortar of Lime Putty and Sand'.

As an alternative to traditional lime and inert mineral finishes (Natural Lime plaster, Natural Breathable Setting Coat + , Fine mortar of lime putty and sand), Blocco Ambiente® or Natural Beton® 200 masonry walls can be finished either inside or outside with Natural Beton® 500 Venezia.

CANAFIBER

Canafiber is a high quality insulation material made with industrial hemp fibers. The unique characteristics of hemp fiber in terms of thermal insulation, humidity regulation and noise reduction contribute in a distinctive way to a healthy and sustainable living environment: the natural comfort.

USE AND APPLICATION

Ideal for the thermo-acoustic insulation of roofs, walls and floors in both new buildings and renovations. Compatible with any type of construction, from traditional concrete systems to more innovative ones such as steel and wood.

European Certification	ETA-13/0518	
Composition	90% industrial hemp fiber 10% bio-composite fibers	tw
Density	35,5 kg/m³	EN 1602
Thermal Conductivity	0,040 W/mK	EN 12 667
Reaction to fire	D-s1, d0	EN 13 501-1
Flame retardant (<1%)	ammonium salt	
Specific heat capacity	1800 J/kgK	EN ISO 10456

Sound absorption coefficient (aw)	0/95 (sp. 14cm)	EN ISO 354
Vapour permeability (μ)	< 1,5	EN 12 086
Airflow resistance	≥ 2,0 kPa.s/m²	EN 29 053
Dimensional tolerance	length ± 2%	EN 822
	width ± 1,5%	EN 822
	thickness ± 5% di 5 mm max	EN 823
Embodied energy	50-80 kWh/m3	

INDUSTRIAL HEMP FIBER

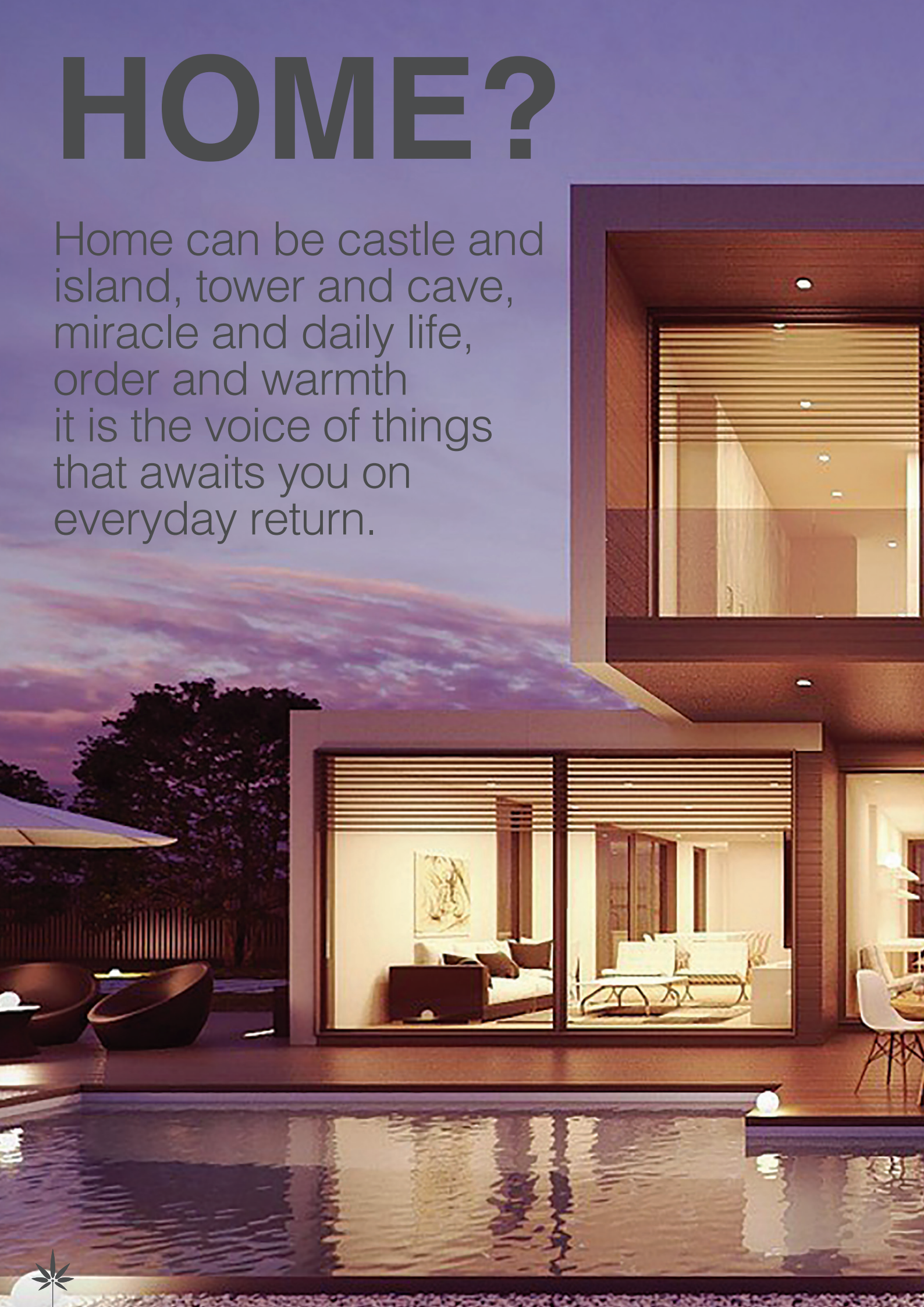
- Unique thermal offset thanks to the high capacity to accumulate energy
- Endless life cycle
- It absorbs up to 20% of its weight in water vapour and self-regulates extraction and release
- Free of protein substances and unappetizing to insects and rodents
- Energy consumption reduced by 90% compared to alternative synthetic and mineral insulation products
- It sequesters CO^2 during growth and contributes to the fight against climate change
- An excellent example of a circular economy

Industrial hemp fiber is a high quality, non-toxic annual cycle renewable resource. The insulating materials in hemp fiber enjoy very high durability. They represent the ideal solution to create healthy and comfortable environments with an environmental impact reduced to a minimum.

Thickness (mm)	Rd	Size (mm)	Panels / package	m² / package	m² / pallet
40	1	1200x600	12	8,6	86,2
60	1,5	1200x600	8	5,8	57,6
80	2	1200x600	6	4,3	43,2
100	2,5	1200x600	5	3,6	36
120	3	1200x600	4	2,9	28,8
140	3,5	1200x600	3	2,2	21,6
160	4	1200x600	3	2,2	21,6

HOME?

Home can be castle and
island, tower and cave,
miracle and daily life,
order and warmth
it is the voice of things
that awaits you on
everyday return.



OUR CREATIONS


PORTO RECANATI (MC)


PORTO RECANATI (MC)


CASTELLINA MARITTIMA (PI)


BUSTO ARSIZIO (VA)


CASARZA LIGURE (GE)


CASTELLINA MARITTIMA (PI)


PORTO RECANATI (MC)


BUSTO ARSIZIO (VA)

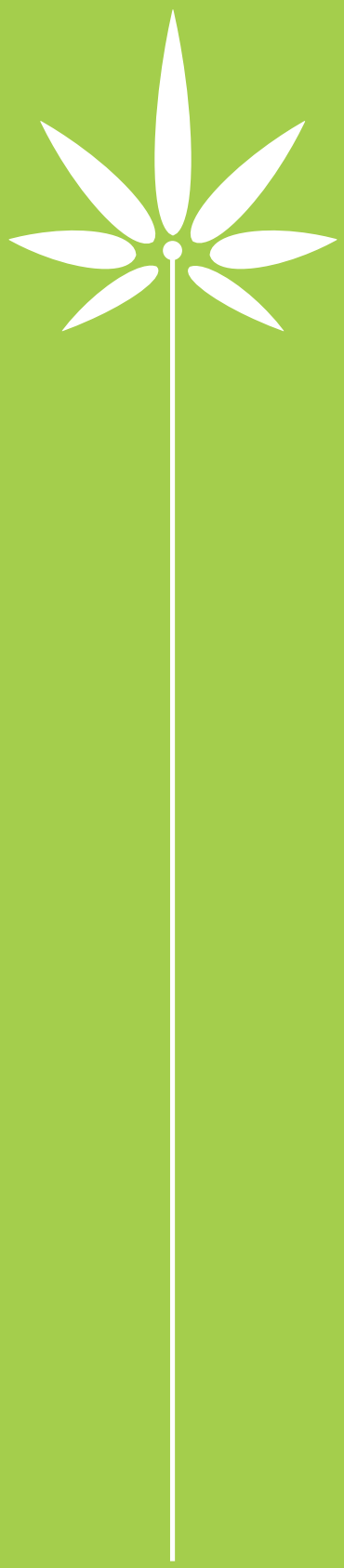

CASARZA LIGURE (GE)


ESLÖV-SVEZIA

NOTES:

The company is constantly improving and adjusting its products.
Technical data, packaging and packing are therefore necessarily subject to change without any notification.
Customers can always check with the company: technical data, documentation and samples.

For optimal use of our products, it is recommended to faithfully follow the instructions given in the Technical User Manual that is provided with the material or upon request.



SENINI

SENINI - Via Erculiani 192 - 25018 Novagli di Montichiari - BS
Centralino: 030 9665711 - senini@senini.it
www.senini.it

MADE IN THE BEAUTIFUL ITALY