TECNO CANAPA

NATURAL BUILDING

SENINIPOSE

CONSTRUCTION **SOLUTIONS**

FRAME STRUCTURAL

SHELL MADE OF HEMP AND LIME

BREATHABLE FINISHES

PLANT SYSTEMS

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Natural Solutions Winning Solutions

The **Tecnocanapa** line was created in 2015 following a meeting between a young start-up in the green building sector and Senini, Italy's leading manufacturer of interlocking paving, kerbs and masonry blocks. The combination of the innovative drive of one and the solid structure of the other gave rise to a business that develops construction solutions based on a lime and hemp biocomposite – **Bio Beton®** and **Biomattone®** – aimed at achieving high quality standards for building envelopes and living environments.

Tecnocanapa offers a wide and flexible range of products. These range from insulation and finishing solutions to advanced raw construction systems: lime-hemp cladding combined with the most innovative structural and plant engineering systems creates healthy, efficient homes with a very low environmental impact. Regenerative solutions with a negative carbon footprint, certified by the Environmental Product Declaration (EPD), which actively contribute to the decarbonisation of the construction sector.

More than 500 construction sites in Italy, including an NZEB building that won the 2016 Green Building Solutions Awards, tell the story and success of a construction technology and material that is future-proof.

The natural hemp and lime biocomposite is suitable for any construction context and different installation requirements. It reaches its full potential when used in a system of synergistic and complementary materials and technologies, such as wooden load-bearing structures, breathable finishes and low-inertia systems. In line with its distinctive holistic approach, Tecnocanapa offers an integrated system whose strength lies in the combination of its parts, even more so than in the individual elements.


Senini industrial site

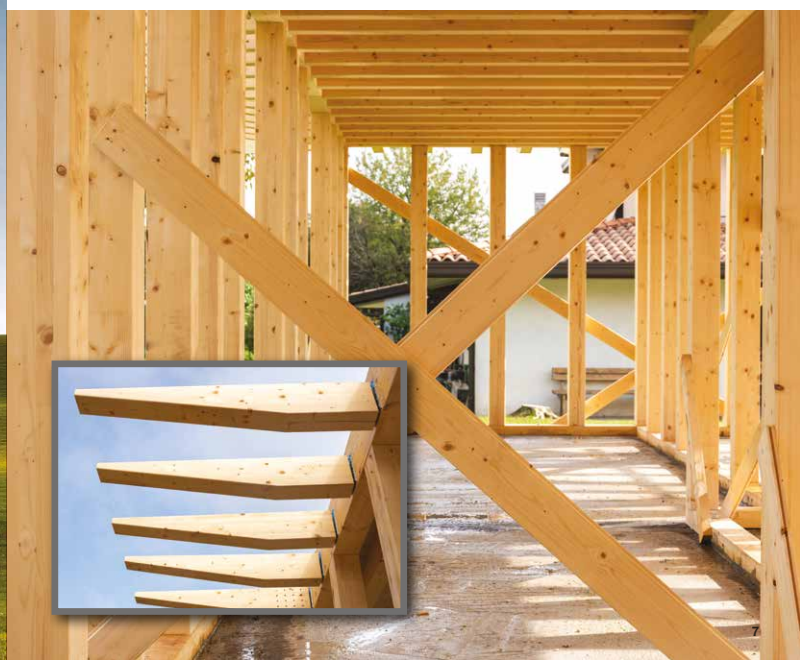
Technical Performance and Environmental Sustainability

- eco-sustainable
- long-lasting
- 100% recyclable
- 100% biodegradable
- carbon negative
- living comfort
- sound-absorbing
- high thermal insulation
- Fire resistant
- energy saving

The wooden structure
for a solid yet lightweight home.

Hemp and lime biocomposite cladding solutions are perfectly suited to all types of load-bearing frame structures available on the construction market: reinforced concrete, steel and timber.

Wood, in addition to having a low environmental impact, like hemp, removes carbon dioxide (CO_2) from the environment during its growth phase and stores it internally for the entire useful life of the building. For this reason, the load-bearing wooden structure with a point system or “platform frame” is the most popular choice for those who want to build 100% green buildings.
From a technical and construction point of view, timber frame solutions allow for the creation of a highly rigid and earthquake-resistant box system, which is quick and easy to install and can be adapted to any architectural solution. They are used for new buildings as well as extensions and additions.
Finally, the wooden load-bearing structure weighs less than the more common steel and concrete solutions, allowing for a reduction in the size of the foundations and, therefore, a reduction in the related economic and environmental costs.



The steel structure
for a sturdy yet flexible home.

There are two types of steel structural frames: heavy steel structures (known as beams) and light steel structures (or light steel frames). The advantage of heavy structures is that they can support greater weights and create larger spaces and spans thanks to the thickness of the elements they are made of. The advantage of light structures, on the other hand, is their lightness and speed of installation.

Steel structures have good anti-seismic properties thanks to their high flexibility and are compatible with all dry construction systems. The simple integration of cladding and systems allows the highest energy, acoustic and fire resistance standards to be met. The possibility of reusing components and recycling 100% of the raw material minimises the environmental impact of steel.

All types of steel structures are compatible with **Bio Beton®** and **Biomattone®** hemp and lime cladding solutions. The naturalness and high vapour permeability of the cladding translate into energy efficiency, living comfort and healthy air.

The reinforced concrete structure
for an innovative yet durable home.

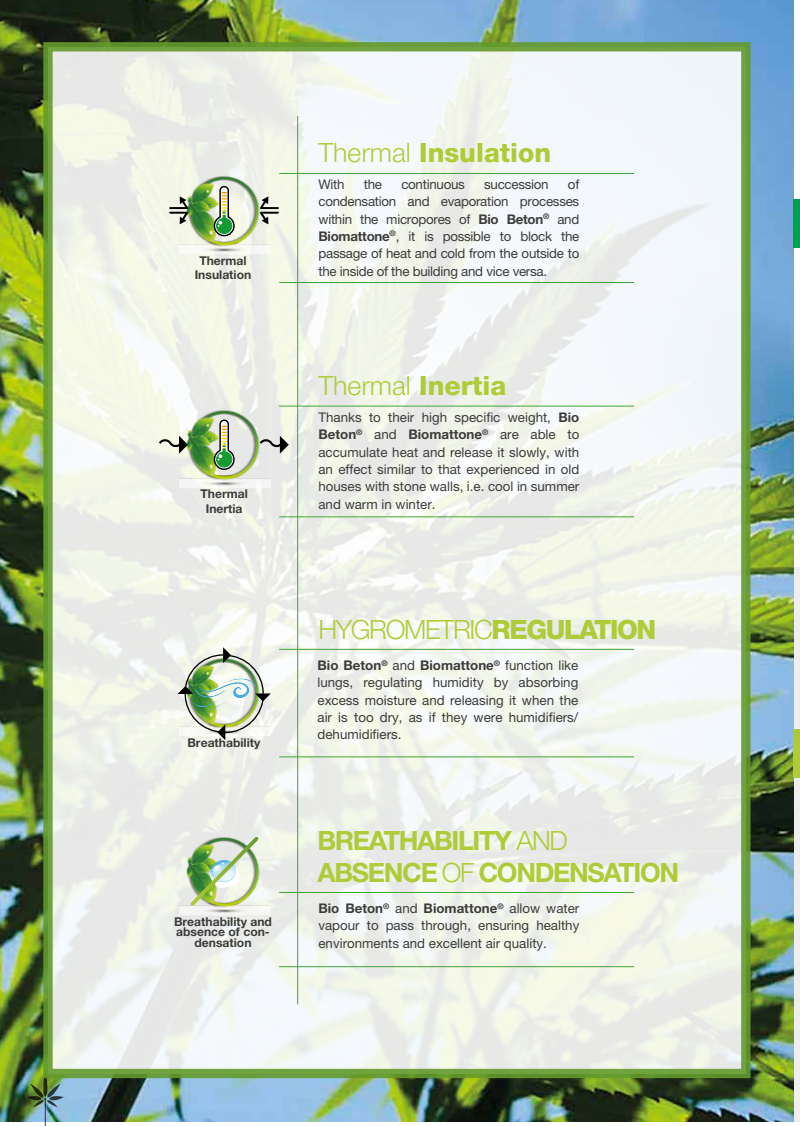
The reinforced concrete structure consists of reinforcement (steel rods interconnected to form a cage) and concrete cast to cover the steel core. Thanks to its remarkable resistance to compression and traction, reinforced concrete is used both for civil engineering works and infrastructure such as bridges, tunnels, roads, dams and railways.

The combination of a concrete structure and a **Bio Beton®** and **Biomattone®** envelope made of hemp and lime allows for the construction of zero-energy buildings, providing them with the highest level of living comfort and the best air quality. The lightness of a natural, breathable envelope protects and covers the concrete structural frame, increasing its durability over time.

Concrete structures are ideal for the construction of a **Bio Solaio®**, the natural alternative to traditional brick and concrete floors. Thanks to **Biomattone®** made from hemp and lime, building a **Bio Solaio®** is quick, competitive and effective. The installation of the hemp and lime block with subsequent reinforcement and concrete casting allows for the construction of a lightweight structural floor that is both thermally and acoustically insulating, allowing for customisation even during the construction phase.

The casing
lime and hemp for a comfortable home.

The various solutions for lime and hemp cladding allow for the creation of products that are uniform in terms of material and performance. From **Bio Beton®** to **Biomattone®**, the products contain few but good ingredients: air lime for durability, hemp shives for insulation and breathability, probiotic additives to optimise the carbonation process and water to bind the mixture. A completely natural patent. A solid insulator for a house that is warm in winter and cool in summer, capable of self-regulating air humidity with positive effects on comfort and well-being. The lime mineralises the hemp, which, at the end of the process, is fireproof and imperishable. The lime and hemp envelope is not affected by ageing, as lime improves its mechanical characteristics over time, ensuring the durability of the entire system.



Thermal Insulation

Thermal **Insulation**

With the continuous succession of condensation and evaporation processes within the micropores of **Bio Beton®** and **Biomattone®**, it is possible to block the passage of heat and cold from the outside to the inside of the building and vice versa.

Thermal Inertia

Thermal **Inertia**

Thanks to their high specific weight, **Bio Beton®** and **Biomattone®** are able to accumulate heat and release it slowly, with an effect similar to that experienced in old houses with stone walls, i.e. cool in summer and warm in winter.

Breathability

HYGROMETRIC**REGULATION**

Bio Beton® and **Biomattone®** function like lungs, regulating humidity by absorbing excess moisture and releasing it when the air is too dry, as if they were humidifiers/ dehumidifiers.

Breathability and absence of condensation

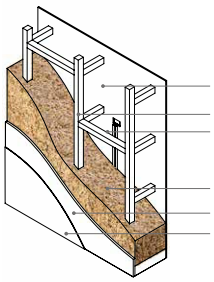
BREATHABILITY AND **ABSENCE** OF **CONDENSATION**

Bio Beton® and **Biomattone®** allow water vapour to pass through, ensuring healthy environments and excellent air quality.

Bio Beton® Jet and **Gypsum fibre board**

36 cm of Bio Beton® 200 Jet (0.053 W/m²K) on internal gypsum fibreboard slab, complete with finishing plaster cycle on the external side (2 cm body plaster + approx. 4 mm skim coat), with the following performance:

WALL THICKNESS 40 CM | **TRANSMITTANCE U = 0,142 W/MQK** | **PHASE SHIFT > 18 HOURS**



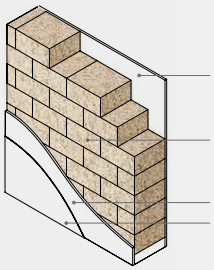
Plus:

- totally eco-friendly solution
- dry slab installation
- installation of systems before spraying (no traces)
- internal wall with excellent mechanical performance
- high thermal insulation = maximum comfort in winter
- excellent thermal phase shift = maximum comfort in summer

Biomattone®

36 cm thick **Biomattone®** curtain wall (0.07 W/m²K), complete with finishing plaster cycle on the external side (2 cm body plaster + approx. 4 mm skim coat), with the following performance:

WALL THICKNESS 39CM | **TRANSMITTANCE U = 0,185 W/MQK** | **PHASE SHIFT > 19 HOURS**



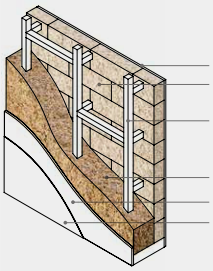
Plus:

- totally eco-friendly solution
- installation like any brick block
- high thermal insulation = maximum comfort in winter
- excellent thermal lag = maximum comfort in summer
- total material homogeneity (single body)

Biomattone® and **Bio** Beton® **Jet**

25 cm of **Bio Beton® 200 Jet** (0.053 W/m²K) on a 12 cm **Biomattone®** internal wall (0.07 W/m²K), complete with finishing plaster cycle on the internal and external sides (2 cm body plaster + approx. 4 mm skim coat), with the following performance:

WALL THICKNESS 40CM | **TRANSMITTANCE U = 0,149 W/MQK** | **PHASE SHIFT > 19 HOURS**



Internal plaster cycle
Biomattone® - sp. 12 cm
BB® 200 Jet wooden support substructure
Bio Beton® 200 Jet - sp. 25 cm
External plastering of the building
External finishing plaster

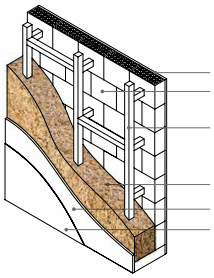
Plus:

- total hemp solution = totally green
- high thermal insulation = maximum comfort in winter
- excellent thermal lag = maximum comfort in summer
- total material homogeneity (single body)
- installation of systems before spraying (no traces)

Bio Beton®**Jet and** Laterizio

30cm of **Bio Beton® 200 Jet** (0,053 W/mqK) on a 12 cm Laterizio P800 internal wall, complete with a finishing plaster cycle on the internal and external sides (2 cm body plaster + approx. 4 mm skim coat), with the following performance:

WALL THICKNESS 45CM | **TRANSMITTANCE U = 0,131 W/MQK** | **PHASE SHIFT > 23 HOURS**



Internal plaster cycle
Laterizio perforated - sp. 12 cm
BB® 200 Jet wooden support substructure
Bio Beton® 200 Jet - sp. 36 cm
External plastering of the building
External finishing plaster

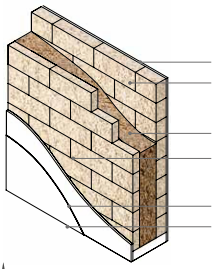
Plus:

- Total eco solution
- Systems installed before spraying (no traces)
- Internal wall with excellent mechanical performance
- High thermal insulation = maximum comfort in winter
- Excellent thermal phase shift = maximum comfort in summer

Biomattone® and **Bio** Beton® **Pronto** filling

12 cm of **Biomattone®** internal, 8 cm of **Biomattone®** external (0.07 W/m²K), filled with 20 cm of **Bio Beton® Pronto** (0.053 W/m²K), complete with finishing plaster cycle on the internal and external sides (2 cm body plaster + approximately 4 mm skim coat), with the following performance:

WALL THICKNESS 43 CM | **TRANSMITTANCE U = 0,145 W/MQK** | **PHASE SHIFT > 21 HOURS**



Internal plaster cycle
Biomattone® - sp. 12 cm
Bio Beton® Pronto - sp. 20 cm
Biomattone® - sp. 8 cm
External plastering of the building
External finishing plaster

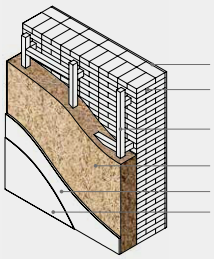
Plus:

- Total eco solution
- Installation of systems before filling in the middle
- Homogeneity of the material
- High thermal insulation = maximum comfort in winter
- Excellent thermal phase shift = maximum comfort in summer

Bio Beton® **Jet** on Existing **Wall**

20 cm of **Bio Beton® 200 Jet** (0,053 W/mqK) on existing stone/brick wall (approx. 40 cm), complete with external finishing plaster cycle (2 cm body plaster + approx. 4 mm skim coat), with the following performance:

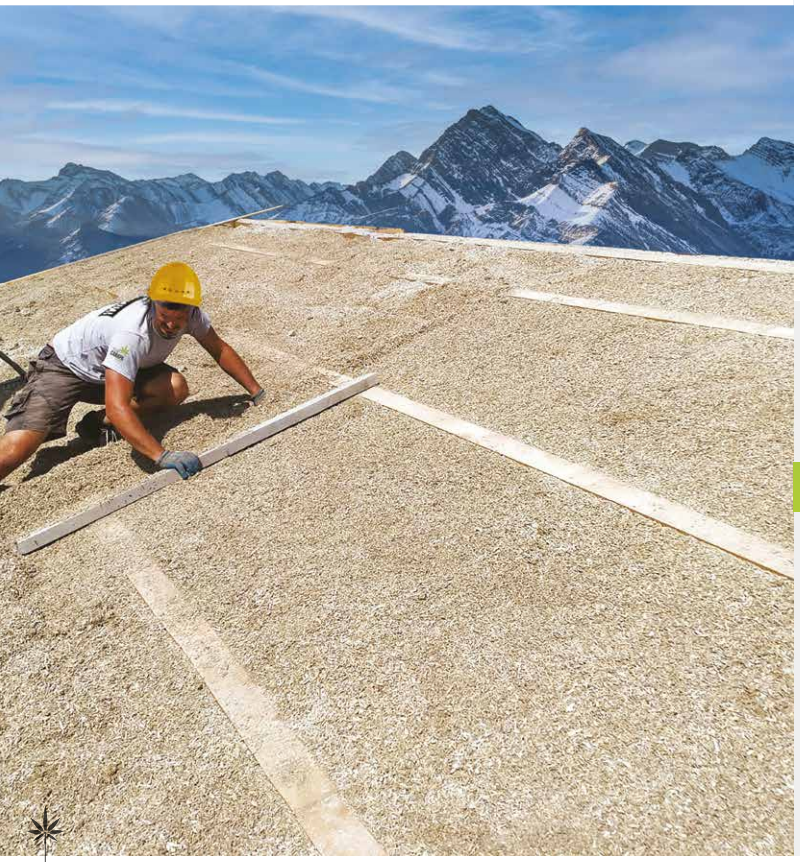
WALL THICKNESS 62CM | **TRANSMITTANCE U = 0,203 W/MQK** | **PHASE SHIFT > 28 HOURS**



Internal plaster cycle
Existing wall - sp. 40 cm
BB® 200 Jet wooden support substructure
Bio Beton® 200 Jet - sp. 30 cm
External plastering of the building
External finishing plaster

Plus:

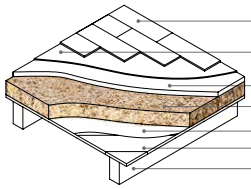
- High thermal insulation = maximum comfort in winter
- Excellent thermal phase shift = maximum comfort in summer
- Insulation material compatible with existing support



Substrate in **Bio** Beton® **Pronto**

15 cm of **Bio Beton® Pronto** (0.053 W/m²K) on internal wooden floor, with high thermal and acoustic insulation properties and internal humidity regulation:

FLOOR THICKNESS 25CM | **TRANSMITTANCE U = 0,193 W/MQK** | **PHASE SHIFT > 16 HOURS**



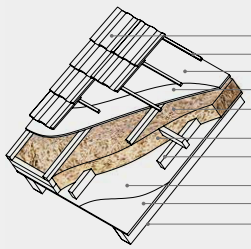
Plus:

- Integrated pipe and cable ducting in the insulation layer
- Indoor humidity control
- High thermal and acoustic insulation
- Excellent sound absorption

Covering in **Bio** Beton® **Pronto**

Wooden roof structure, insulated with 25 cm of **Bio Beton® Pronto** (0.053 W/m²K), with ventilation chamber and roof covering:

PACKAGE THICKNESS 35CM | **TRANSMITTANCE U = 0,184 W/MQK** | **PHASE SHIFT > 14 HOURS**



Plus:

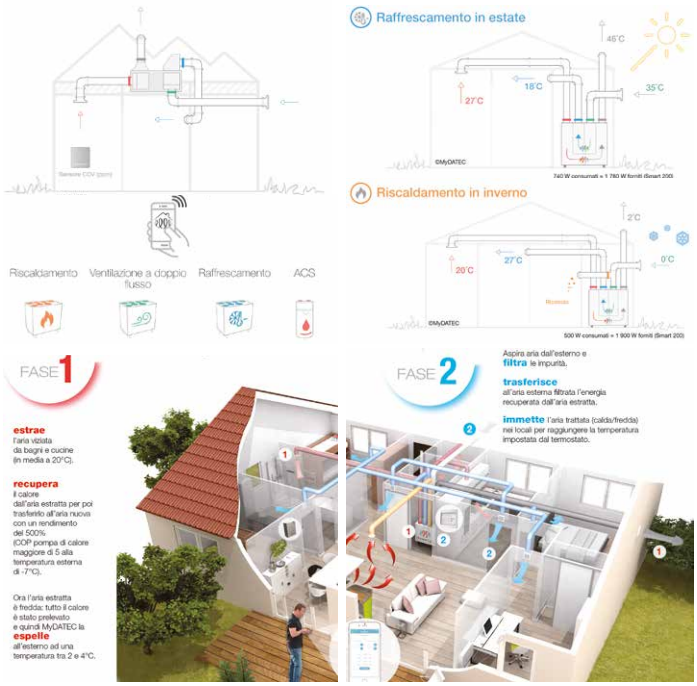
- totally green solution
- high thermal insulation = maximum comfort in winter
- excellent thermal lag = maximum comfort in summer
- quick installation
- total breathability = high indoor comfort

Plaster and Finishes
for a warm and breathable wall.

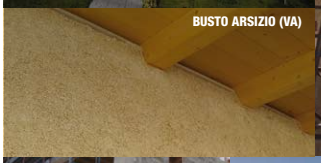
The finishes in the Tecnocanapa line are all lime-based, in order to guarantee the breathability and durability of the insulating envelope. As an alternative to traditional lime and mineral aggregate finishes (Natural Lime Plaster, Natural Breathable Stabiliser Plus), **Biomatton®** or **Bio Beton®** masonry can be finished both internally and externally with **Bio Beton® 500 Venezia**, a rustic plaster with a **Canaposo** or **Canapulino** textured finish, **Canapulo Fine**, **Legante Dolomitico Naturale** and **Additivo Probiotico**. In addition to ensuring maximum breathability, the textured finishes take on the natural appearance of exposed hemp and contribute to the so-called “warm wall” sensation.

Low inertia systems
only what is necessary for comfort.

Building with **Bio Beton®** or **Biomattone®** allows you to achieve high thermal performance of the building envelope, with minimal heat loss and excellent indoor comfort almost all year round. The thermal energy required to achieve internal comfort during the coldest weeks of winter or the hottest weeks of summer is reduced to a minimum. This means that the energy required for heating and cooling is very low. Traditional systems, which are designed to work with a lot of energy and for a long time, are useless and unnecessarily expensive in these situations. To combat the humid climate that characterises our territory, as well as to move closer to a passive house, a Controlled Mechanical Ventilation system with heat recovery is ideal. This system is easy to install and guarantees the necessary exchange of indoor air without heat loss, at a reasonable cost. It dehumidifies when necessary and, if integrated with a heat pump, raises or lowers the indoor temperature when required. By adding an electric or heat pump system with storage for domestic hot water, you can forget about gas!



SOME ACHIEVEMENTS



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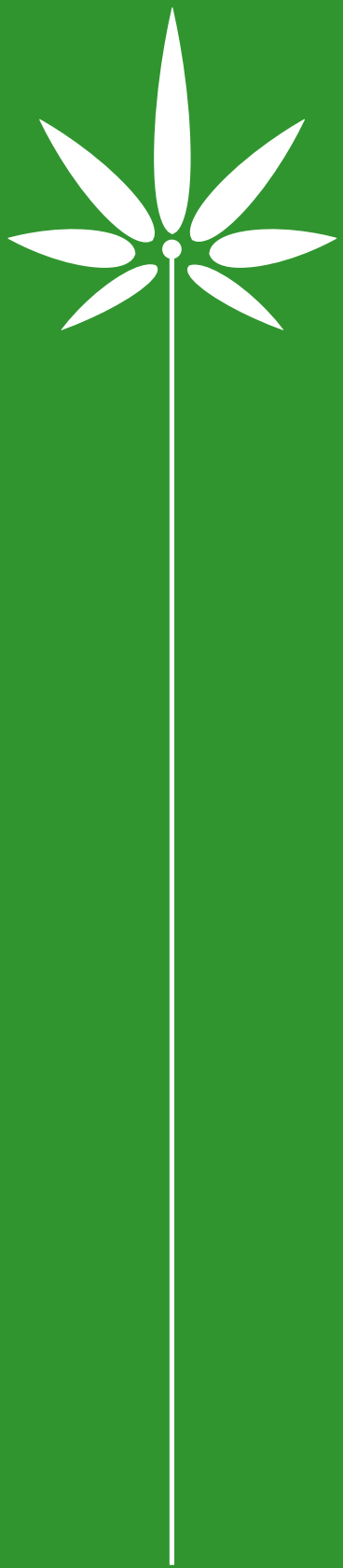

SENINIPOSE

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