



green walls
environment
thermal insulation
aesthetics
biodiversity

vivagreen®

vertical greening



Why green walls?

Urban densification is leading to a reconsideration of the role of plants in the city. This demand for “greener cities” which emanates from city-dwellers, is being taken up more and more by all levels of government, right up to the European Commission, which has created a “Green infrastructure Council”.

The environmental benefits of green roofs are indeed becoming clearer and clearer, and the same will happen for green walls⁽¹⁾ in the future: absorption of dust and CO₂, cooling the air, meaning they have an active role to play in the fight against urban heat islands - these are just some of the substantial positive effects of these new green surfaces. These effects, repeated across a City, will only really be appreciated if they are considered as part of an overall perspective.

For the building itself, the reduction of the acoustic and thermal impacts comes on top of the collective benefits, offering concrete advantages that can be perceived by the building's users.

Finally, green walls are visually attractive thanks to the textures of the plants, flowers, changes in appearance through the seasons, all contributing to the successful integration of architecture into its environment.

(1) Different studies are underway in Austria, Spain, the United Kingdom...

The Vivagreen® concept from Sopranature®

In France, since it was first thought of at the end of the 1980s by Pierre Geisen, Chairman of **SOPREMA**, the greening of buildings has found concrete expression in green roofs, with the **Sopranature®** system. Green walls, engineered systems, have taken off at the beginning of the 2000s, with a pioneering installation covering several hundred square meters in Alsace, and the registration of a patent.

The **Vivagreen®** wall system has gradually been developed and honed thanks to different installations and experiments and it is now a complete, structured system.

Vivagreen® includes:

- ✓ Its own fastening structure.
- ✓ A modular design that lends itself to all types of site, in the form of removable metal modular panels.
- ✓ Pre-grown vegetation for an immediate effect
- ✓ A specially designed irrigation system.
- ✓ A dedicated maintenance programme.

The Vivagreen® solution is:

- 1. complete system,**
- 2. entirely managed by Sopranature®** (study phase, installation by approved applicators, maintenance),
- 3. with remarkably attractive architectural aspect** (regularity of the modules and the layout, peripheral finishings, quality of the plant covering),
- 4. designed to last** (metal parts are aluminium and stainless steel, growing medium and its implementation designed for minimal settling, perennial plants),
- 5. water-thrifty** (research work done on methods and frequency of watering, as well as on the properties of the plants),
- 6. reference product** (from a qualitative point of view, **Vivagreen®** is among the very best products on the market).

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The system

Vivagreen® is a complete patented solution for greening façades, with an instruction manual approved by a French certification body. Every **Vivagreen®** project is unique and specially designed for its site, guaranteeing project owners optimal results. The specificities of the operation are taken into account from the very beginning of the project, whether it concerns the layout of the modular panels, from the choice of species to the exposure of the wall, or any maintenance-related particularities.

Description of the system

- ✓ Fastening structure fixed into the bearing wall.
- ✓ Modular panels containing pre-grown plants installed on the fastening structure. The growing medium in which the plants are developing, is held in place by flexible, rot-proof netting and then a stainless steel grid with a 50 mm mesh.
- ✓ Integrated watering system.
- ✓ Peripheral gutters and finishings.

Vivagreen® without external insulation

- ① Bearing structure
- ② Insulation (if recommended)
- ③ Rain barrier (if required)
- ④ Fastening brackets
- ⑤ Omega profile
- ⑥ Single slider

Vivagreen® with external insulation

- ⑦ Double slider
- ⑧ Modular panel
- ⑨ Anti-settling bar
- ⑩ Stainless steel grid
- ⑪ Growing medium
- ⑫ Plants
- ⑬ Dripline
- ⑭ Side finishing profile
- ⑮ Top finishing profile
- ⑯ Gutter

CHARACTERISTICS OF VIVAGREEN®**Fastening structure****Aluminium omega-type fastening profile****Aluminium sliders****Accessories supplied:**

- ✓ Fastening brackets
- ✓ Custom-made finishing profiles.
- ✓ Gutter.
- ✓ Anti-vandal system⁽¹⁾.

Overall thickness: 136 mm**Depth of air space:** 76 mm**Vivagreen® modular panel****Standard dimensions:** 1200 (width) x 600 (height) x 60 (thickness) mm**Custom dimensions:** as per study**Weight at MWC⁽²⁾:** 65 kg/m²**Coverage rate:** 70% on delivery for plants with a 9-month growing period.⁽³⁾**Surface area of a standard modular panel:** 0.72 m²**The modular panel consists of:**

- ✓ A sheet of aluminium bent to particular design.
- ✓ Four hooks to fasten it to the structure.
- ✓ An anti-settling bar.
- ✓ Rot-proof netting with a 5 mm mesh.
- ✓ A stainless steel grille with a 50 x 50 mm mesh.
- ✓ Fastening clips for the driplines.

(1) On request.

(2) Maximum water-holding capacity.

(3) Shorter times: please enquire.



Vegetation

The lasting adaptation of plants to vertical planting requires real expertise.

The challenge met by the **Vivagreen®** wall system is that of using plants that are both water-thrifty and capable of developing in very thin layers of growing medium.

The Vivagreen® varietal range is based on three complementary sources of information:

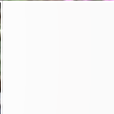
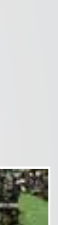
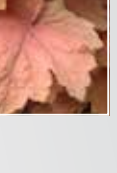
- ✓ observation of nature (spontaneous plant formations from comparable biotopes),
- ✓ the experience gained with soilless perennial cultivation in thin layers of growing medium with **Sopranature®**,
- ✓ the specific research and experiments conducted on the **Vivagreen®** wall system over several years.



The Vivagreen® wall system is the first system where the growing medium is accessible from the front, which allows the propagation of species by direct reseeding or by the development of runners (horizontal axis).

The Vivagreen® wall system is therefore a “biodiversity facilitator”.

- ✓ The **Vivagreen®** varietal range includes evergreens and deciduous plants, plants that are abundant or compact, flower-bearing or not, very resistant and with varied leaf and flower textures and colours...
- ✓ The palette of plants available for **Vivagreen®** makes it possible to meet the most demanding technical constraints as well as a variety of aesthetic requirements for a project.
- ✓ The **Sopranature®** design office draws up a list of plants specifically for each project, based on different technical criteria (climate, exposure, covering capacity...) and aesthetic criteria (texture, volume, flowering...), working closely with the project manager.
- ✓ Furthermore, the specific design of the **Vivagreen®** modular panels, which have growing medium accessible from the front, allows for secondary colonisation of the species introduced (by reseeding or the development of runners), thereby reinforcing the overall resistance of the plant cover.
- ✓ This unique arrangement also gives local vegetation the chance to get rooted, fostering **biodiversity**.



The **Vivagreen®** wall system offers a range of over a hundred species of plants

The growing medium



Sopraflor F growing medium (in situation)

The **Sopraflor F** growing medium has been specifically developed for the **Vivagreen®** system. It meets the different constraints encountered in vertical greening thanks to an assembly of different lightweight mineral and organic materials.

This growing medium has high wettability, limiting water loss whilst retaining excellent permeability. Its properties enable optimum development of root systems. Its particle size distribution curve and the use of very stable organic materials avoid the biodegradation of the growing medium and prevent it settling over time. This also increases its ability to retain nutrients and limits leaching.

PROPERTIES OF THE GROWING MEDIUM

Density at MWC⁽¹⁾: 0,8 T/m³

Permeability: > 60 mm/min

Porosity (vol.): 90% (non-asphyxiating)

pH: 5,5 to 6,0

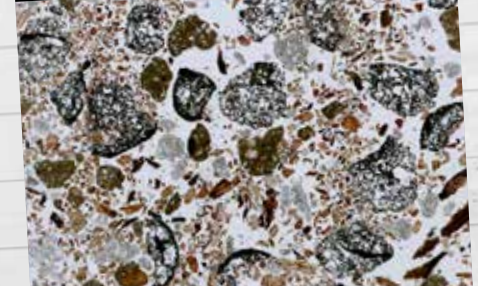
% fines (vol.): < 3%

Maximum water retention at MWC⁽¹⁾: ≥ 50% vol.

Particle size: 0/10 mm

(1) Maximum water-holding capacity, according to the professional regulations on green roofing ("RP TTV")

Sopraflor F growing medium (cross-section)





Controlled irrigation

A great deal of work has been done by **Sopranature®**'s Research & Development department to reach the best characteristics of the irrigation system specially developed for the **Vivagreen®** wall system.

Description of the irrigation system

The irrigation system recommended for the **Vivagreen®** wall system



consists of the following components:

- 1 **Water inlet**
- 2 **Backflow preventer:** device preventing the nutrients intended for the plants from flowing back into the mains water supply.
- 3 **Pressure reducer:** adapts the mains pressure for optimum operation of the drippers.
- 4 **Manometer:** controls the pressure in the irrigation system.
- 5 **Water meter:** tracks the green wall's water consumption.
- 6 **Filter:** protects the drippers against any risk of obstruction by particles.
- 7 **Programmer:** allows the automated management of the irrigation system (quantities and frequencies).
- 8 **Irrigation valves:** valves managed by the programmer to open and close the irrigation network.
- 9 **Dosing pump:** Dosatron pump providing automated fertilisation of the plants.
- 10 **Fertiliser container:** fertiliser is injected by the Dosatron into the system to feed the plants.
- 11 **Temperature probe:** enables the winter irrigation of the wall to be automated.

To enable automated purging of the system, this installation must be located in a frost-protected room.

An optimum irrigation system

A green wall rarely gets advantages of natural rainfalls. The verticality of the structure makes it all the more complex to maintain a moisture content satisfactory for the development of the plants. The lasting success of the structure is therefore closely linked to the quality of its irrigation system.

Automated irrigation system It must be designed to enable automatic purging of the circuit after each irrigation cycle, which is managed by the programmer.

It is supplied by one or more solenoid valves enabling differentiated management of the water supply depending on the characteristics of the wall (exposure, height of the wall ...).

Two types of driplines (8 or 16 mm) are used for more precise adaptation to the specificities of the site. The drippers are spaced 15 cm apart in all cases, which favours a homogeneous distribution of the water in the growing medium. Their low flow rate (2 litres/h) enables the water to diffuse slowly through the growing medium, thereby limiting water loss.

Irrigation sequences Short, but repeated sequences guarantee optimised irrigation, reducing both water consumption and water loss. A customised sequencing scheme is provided by **Sopranature®** for each project.

Easy disassembly The dripline, which is invisible from the outside, can be unclipped independently of the modular panels. This is a major advantage, enabling the irrigation system to be maintained and checked easily without having to take down the entire **Vivagreen®** wall.

Water consumption Depending on the region and the exposure, a **Vivagreen®** wall consumes from 300 to 450 litres/m²/year.

Fertilisation Fertiliser is added directly in the irrigation water by means of a dosing pump (Dosatron). Fertiliser quantities are kept to a minimum so as to avoid over-exuberant growth of the plants and the excessive water consumption that would entail.

Winter irrigation Experience has shown that winter watering is indispensable to maintain the system long-term. In fact, the roots of plants installed vertically also require water during this period. For this purpose, **Sopranature®** recommends installing a temperature probe.

Water quality Different qualities of water can be used to irrigate **Vivagreen®** walls. The central irrigation system equipment will be adapted to the type of water to be used, whether it is mains water, harvested rainwater or well water.

Frost-protected technical room This small room guarantees that the equipment is protected against frost and any other damage. It guarantees compliance with the legislation concerning the presence of chemicals (fertiliser) in buildings used by the public. It is also indispensable for the automation of winter watering.

Recycling A system of recycling surplus water is perfectly compatible with the **Vivagreen®** system. Our design office will study the possibilities on request.



Installation

The **Vivagreen®** wall system is easy to install, bearing in mind that the central irrigation equipment must be installed first.

4-step installation

1 THE FASTENING STRUCTURE

This consists of aluminium omega profile, which are fixed onto the load-bearing wall⁽¹⁾ at the distances specified in the plans using metal fastening brackets⁽²⁾. The sliders (horizontal axis) are inserted into these lengths of profile. These sliders will receive the 4 hooks of the modular panels; the sliders are fixed at precise intervals defined in the plans.



2 THE PRE-GROWN MODULAR PANELS

These are supplied with 70% plant cover⁽³⁾; there is no planting on site. The modular panels are hung on the sliders by their 4 hooks. The modular panels are installed according to the layout planned, starting at the bottom of the wall.



3 THE IRRIGATION SYSTEM

The central irrigation equipment, which is connected to the water supply, must already be in place when the modular panels are fitted. The driplines, which already have been connected to the main line pipe, are inserted into the clips, as the installation of the modular panels progresses.



4 FINISHING PROFILES AND GUTTERS

The side and top finishing trims are mechanically fixed onto the aluminium profiles, at the end of the installation. At the bottom of the wall, the water is collected by a gutter (custom made) so that it can be evacuated for recycling.



(1) **Vivagreen®** can be installed on concrete or masonry walls, but also timber or steel as long as they have been the subject of a dimensioning study.

(2) The **Vivagreen®** wall system is compatible with external insulation (in this case, the size of the fastening brackets will be adapted to the thickness of the insulation).

(3) The percentage may be lower if the growing time is less than 9 months.

Installation step-by-step



1 Marking out the wall



2 Installing the aluminium omega profiles



3 Fastening on the sliders



4 Positioning the modular panels



5 Installing the modular panels



6 Installing the irrigation drip system



7 Fitting the finishing profiles



8 Fitting the gutter



9 Job finished



Maintenance

The **Vivagreen®** wall system was designed with its maintenance in mind. Successful maintenance is requested for the appearance, health and longevity of the plants.

Characteristics of the system:

- ✓ Easily removable modular panels.
- ✓ Easy access to the driplines.
- ✓ Possibility of direct replanting in the modular panels.

The accessibility of the entire planted surfaces is a notion that must be taken into account by the project manager. For any location

with heights over 2 m, accessibility will need to be organised, either with lift platforms or scaffolding, or with anchor points for rope access workers.

The overall maintenance costs depend largely on the surface area and the project owner's specific requirements.

Operations to be planned

OPERATION	DETAILS	FREQUENCY
Weeding	Manual operation.	at least 2× /year
Pruning	Elimination of dry and excess leaves in autumn.	1× /year
Cleaning	Concerns the modular panel and general water collection gutters.	1× /year
Checking fertiliser application	Adjustment of the quantities according to the season. Renewal of the nutrient solution.	4× /year
Checking the irrigation	Seasonal modification of the settings. Checking the equipment (timer, valves...). Checking overall functioning.	at least 4× /year

What you need to know

- ✓ It is highly desirable that the detailed technical specifications for a project should include the maintenance requirements of the **Vivagreen®** structure, in particular as far as the responsibilities of the contractors before and after acceptance of the work are concerned.

- ✓ Detailed maintenance instructions are available on request.



The steps in a Vivagreen® project



The creation of a green wall is an operation that requires a whole set of skills. The **Sopranature®** department at **SOPREMA** is at the disposal of project owners and professionals involved in **Vivagreen®** projects to share its expertise.

The creation of a green wall involves the following steps:

- ✓ According to the project manager's request (see form on page 15), a **technical study** is done by the **Sopranature®** design office, along with an estimate of the cost. A technical description is provided.
- ✓ A precise **layout plan** is then drawn up in conjunction with the project manager.
- ✓ Once the order is received, the production of the modular panels in the sizes chosen is ordered.
- ✓ The planting scheme is then defined taking into account the constraints of the project (see pages 6-7).
- ✓ The planting is done by our production department for **pre-growing**.
- ✓ Once pre-grown, the modular panels are delivered to the site and immediately **installed on the fastening structure already** in place.
- ✓ The irrigation and fertilisation system is then **started up and adjusted** by the irrigation contractor chosen.
- ✓ Once the initial settings are completed, the **maintenance contract** can start.

Sopranature®:

- puts the applicator in charge of installing the system in contact with a partner specialising in irrigation systems,
- coordinates the different contractors and provides technical assistance on site.

The system is installed by the applicator (façade specialist or experienced landscaping contractor) following the phases described on page 11.



Choose Sopranature® expertise

In light of the significant investment of a green wall, you cannot take chances on experimental solutions. It is essential to take account of the building regulations, particularly when the surfaces concerned overlook public spaces.



Developed by a large industrial group with strong experience of greening buildings, the **Vivagreen®** wall system has been designed to provide the right answers to the various constraints involved in vertical greening:

- ✓ **An overall concept.**
- ✓ **Reliability, durability.**
- ✓ **Adaptability.**
- ✓ **Skilled design office.**
- ✓ **Integration of the building standards**
combined with acknowledged expertise in the vegetation aspects.



The Vivagreen® system has a technical assessment of performance from a french technical body.

SOPREMA at your service

Would you like to talk to a sales person?

Do you have some technical questions about how to use Sopranature®?

Tel.: +33 3 88 79 84 45

Fax: +33 3 88 79 84 44

E-mail: sopranature@soprema.fr

Find all the information about Sopranature® on www.soprema.com

custom designed

Check-list to be completed for all studies for a project.

Please send by fax to: + 33 (0)3 88 79 84 44 or by e-mail to sopranature@soprema.fr

DATE OF REQUEST

..... / /
DD / MM / YYYY



DATE WHEN STUDY
IS REQUIRED

..... / /
DD / MM / YYYY

IDENTITY OF ENQUIRER

Company name*: Business*:

Location of company*:

Enquirer*:

E-mail*:

Telephone:

IDENTIFICATION OF THE PROJECT

Name of the project*:

Location*:

Department*:

Zipcode:

Country:

MAIN CHARACTERISTICS OF THE PROJECT

Surface area of the façade to be greened¹: m²

Bearing structure: ☐ Concrete ☐ Timber ☐ Steel ☐ Other: please specify

External insulation ☐ YES ☐ NO

Dimensions of the panel required:

Size W = 1.20 m / H = 0.60 m ☐ YES ☐ NO

Other size depending on layout plan ☐ YES ☐ NO

OTHER USEFUL INFORMATION

Orientation of the façades concerned: ☐ North ☐ South ☐ East ☐ West ☐ Other:

Presence of door/window frames in the surfaces concerned ☐ YES ☐ NO

Presence of a water point near the surfaces concerned ☐ YES ☐ NO

Technical room available for secure installation of the central irrigation equipment ☐ YES ☐ NO

* Required fields

¹ Please provide a drawing of the façades concerned, as well as a site plan showing the orientations.



SOPREMA at your service

Would you like to talk to a sales person about a current or future project?

Do you have questions about **Sopranature®** solutions?

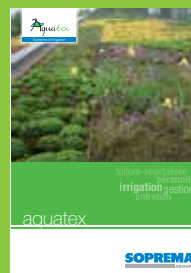
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Find all the information about **Sopranature®** on www.soprema.com



All **Sopranature®** documentation is available on request:



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