



WHITE PAPER SEMPERGREEN VERTICAL SYSTEMS®

LIGHT EFFECTIVENESS

The importance of good lighting for a green wall



Outdoor plants naturally receive a lot of light from the sun - the largest and most natural light source on earth. Interior plants, on the other hand, do not always receive sufficient light. This also applies to plants that have been incorporated into a green indoor living wall.

Light is vital for plants. Light not only determines the day and night rhythm of the plant, but also the season and life cycle. Plants convert the energy of light into food through photosynthesis. Light is therefore of great importance for the growth and health of plants. To learn more about the usefulness and necessity of effective lighting of a green wall in the interior space, we will answer the questions below in this white paper:

1. Why does an indoor living wall require lighting?
2. How much light does an indoor green wall require?
3. What is grow lighting?
4. Why is LED grow lighting the best choice for indoor green facades?
5. What type of light fittings are there?
6. Why is a good lighting plan important for the illumination of indoor green walls?
7. What do indoor green facades look like with various types of lighting?
8. Conclusion

Tip: *are you planning to install interior plants in the form of a green wall in your office environment, shop, hotel lobby, showroom, reception or waiting area? Ask your architect or interior decorator to include the lighting for the indoor green wall directly in the complete lighting plan.*



1. WHY DOES AN INDOOR LIVING WALL REQUIRE LIGHTING?

Interior plants do not automatically receive sufficient light. The growth and development of plants strongly depends on the quality and amount of light they perceive. Plants need light for photosynthesis, the process by which they convert carbon dioxide into carbohydrates. Without good lighting, photosynthesis does not take place. This can cause a plant to turn yellow or limp. The plant disease resistance decreases, and the plant becomes more sensitive to diseases and pests, which can eventually kill the plant. Providing the right lighting to plants in an indoor green wall is therefore essential for preserving the plant and its green appearance. In this white paper we will further discuss the lighting that is applied to the indoor green walls of Sempergreen Vertical Systems. This green facade system is known as SemperGreenwall.

2. HOW MUCH LIGHT DOES AN INDOOR GREEN WALL REQUIRE?

Every building and every space is unique. The extent to which interior plants in a green wall should be illuminated depends on a number of criteria, for example:

- The dimensions of the indoor living wall
- The presence of a window in the space of the indoor green facade
- The location of the indoor living wall in relation to the window
- The position of the window in relation to the sun (north, east, south or west)

There is no single standard that describes how long interior plants should be lit. However, the guideline below can be followed:

- A minimum of 8 hours of lighting per day
- A minimum of 4 hours of rest (so no lighting at all)

Now it may happen, that the lighting is on long enough, but that the indoor green wall is not illuminated with the right type of light. The lighting is then of little use. Applying the right lighting requires expertise.

3. WHAT IS GROW LIGHTING?

For the illumination of interior plants, it is important that artificial light is applied, that corresponds as closely as possible to natural lighting (1). Growing light is a unique artificial light that is recognized by the plants in the indoor living wall. Growing light is very similar to natural sunlight and thus stimulates photosynthesis. Specialized grow lighting is therefore the ideal solution for illuminating an indoor plant wall.



4. WHY IS LED GROW LIGHTING THE BEST CHOICE FOR INDOOR GREEN FACADES?

Effectively illuminating interior landscaping requires specialized grow lighting ⁽²⁾. Sempergreen Vertical Systems uses innovative LED grow lighting to illuminate a SemperGreenwall Indoor. LED grow lighting has a broad light spectrum and combines the right colours to initiate the plant's growth and flowering process. Since white light is most pleasing to the human eye, the red light and blue light spectrum have been adjusted in such a way that it looks like warm white light. This results in friendly white grow light; good for people, good for plants.

THE ADVANTAGES OF LED LIGHTING ARE:

- Long lifespan; a life of up to 50,000 hours
- Sustainable and energy-efficient application - up to 90% savings on energy costs
- Provides the required colour spectrum for plant growth
- Long-term constant light output
- Less heat radiation

LED grow lighting is therefore the best choice for illuminating indoor green facades, as it both stimulates photosynthesis with the right colour spectrum, while being sustainable and energy efficient at the same time.

5. WHAT TYPE OF LIGHT FITTINGS ARE THERE?

LED lighting can be applied to a project using various types of fittings. There are linear strips, surface-mounted or recessed spots. The choice of fitting can be tailored to the lighting plan for the entire room. The type of fitting does not affect the light quality. When choosing a luminaire, it is therefore mainly about the design. In order to make the right choice, an assessment can be made based on:

- the installation possibilities of spots on location
- customer preference
- the presence of a lighting plan
- the price



Linear strip



Surface-mounted spot



Recessed spot



6. WHY IS A GOOD LIGHTING PLAN IMPORTANT FOR THE ILLUMINATION OF INDOOR GREEN WALLS?

Indoor green walls are widely used in offices, museums, restaurants, shopping centres, hotel lobbies, waiting areas and showrooms. A high-quality lighting plan is not only functional but is also the piece of design with which the atmosphere in the room is created. In order to find the right balance in the lighting of your interior space, it is advisable to include the lighting for the green plant wall in the complete lighting plan. An (interior) architect can help you with this. In this way you will have an overview of which lighting is used where and the costs are also immediately mapped out. The growth lighting can then be combined with the mood lighting or functional lighting to illuminate workplaces. By choosing a type of fitting early on, the grow lighting can become an integral part of the lighting style throughout the room.

7. WHAT DO INDOOR GREEN FACADES LOOK LIKE WITH VARIOUS TYPES OF LIGHTING?

View the examples of various SemperGreenwall Indoor projects below to see the effect of different fittings on the atmosphere and appearance of the room.

Example 1: Linear strip

Project: UniQure Amsterdam, The Netherlands





Example 2: Surface-mounted spot

Project: The Platform Utrecht, The Netherlands



Example 3: Recessed spot

Project: Hyatt Regency Hotel Amsterdam, The Netherlands





8. CONCLUSION

Light is vital for plants. Interior plants - such as an indoor living wall - do not automatically receive sufficient light. Providing the right lighting to plants in an indoor green wall is essential for preserving the plant and its green appearance. Effectively lighting a green plant wall requires specialized grow lighting. Growing light is very similar to natural sunlight and thus stimulates photosynthesis. LED grow lights offer a broad light spectrum and combine the right colours to initiate the plant's growth and flowering process. LED lighting can be applied to a project in various fittings. In order to find the right balance in lighting, it is recommended to include the lighting for the indoor green facade in the complete lighting plan.

By choosing a type of lighting and fitting early on, the grow lighting can become an integral part of the lighting style throughout the office, restaurant, shop, waiting area, hotel lobby or reception area.

SOURCES

1. Chiang, C., Bånkestad, D., & Hoch, G. (2020, 27 September). *Reaching Natural Growth: Light Quality Effects on Plant Performance in Indoor Growth Facilities*. MDPI. <https://www.mdpi.com/2223-7747/9/10/1273>
2. Zielinska-Dabkowska, K. M., Hartmann, J., & Sigillo, C. (2019, 1 May). *LED Light Sources and Their Complex Set-Up for Visually and Biologically Effective Illumination for Ornamental Indoor Plants*. DOAJ. <https://doaj.org/article/3e90e49575514a52b1a571882477fdcb>



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