

Greenhouse Lighting



# Greenhouse lighting

Discover a world of difference



lemnis  
lighting

# Lemnis Lighting makes a world of difference

## LED lighting in horticulture

If you are currently looking into greenhouse lighting, you are probably considering all of your options. A lighting system is a costly investment, but one that is necessary to achieve strong growth in operating income. Apart from the cost of the system itself, a once-off investment, the energy it requires is also a significant cost item, since it is an annually recurring expense. Keeping these costs manageable requires a well thought-out strategy.

## Low energy consumption

Lemnis Lighting has successfully developed a low-energy lighting solution, called Lemnis LED lighting, which makes it possible to achieve considerable savings on energy costs. In addition to this important advantage, the Lemnis LED lighting system is also exceptionally effective. This means it emits more micromoles per watt than 'normal' LED or conventional lighting, resulting in greater output.

## Efficient capacity

Plants are known to assimilate more effectively at certain wavelengths of the colour spectrum. Light from conventional fixtures only covers a small section of the spectrum range, so the plant only uses a small percentage

for photosynthesis. But Lemnis Lighting has increased this efficiency by creating precisely those wavelengths that promote plant growth. Blue and red LEDs, for example, have been developed that emit the most effective light for plant growth, resulting in more significant growth and a higher production rate. The LEDs are continuously under development in order to produce better and more efficient solutions. For the red LED, for instance, we have already achieved an output of more than 2.0  $\mu\text{mol}/\text{sec}$  per watt and 1.0  $\mu\text{mol}/\text{sec}$  per watt for the blue LED.

## Water-cooled system

Since the system is so unique, Lemnis LED lighting fixtures cannot simply be plugged into an outlet. We had to devise a completely new type of system to make it possible to use these LEDs as efficiently as possible. Approximately half the capacity of the LEDs is converted into heat. This heat is not radiated to the plant, as with conventional lighting, but must still be removed in order to ensure the efficient functioning of the LED lights. This takes place most effectively at a temperature of  $< 20^\circ\text{C}$ . This temperature is achieved by having cooling water flow behind the LEDs, thereby

conveying away the heat. Even the power supply, which also produces heat, is cooled by water. The heated water can easily be reused by, for example, adding it to the heating system or storing it for future use. The entire system has also been constructed as compactly as possible to ensure maximum daylight utilisation.

## Safety

We believe that our Lemnis LED system has created a world of opportunities for the horticulture sector. The LEDs can be hung at the top of the lattice rafters and used for multi-layered cultivation. Since the lighting can be installed in dark, difficult to reach, humid and dirty locations, our LED lighting is designed with the following features:

- The entire LED system is IP6-rated. This means the fixtures can be hosed off with water and used in spaces with 100% RV.
- The LEDs operate at 50 volts, lowering the fire risk of, for example, the protective cover.

## Long service life

The fixtures have an estimated service life of 50,000 burning hours. Lemnis



Lighting guarantees 30,000 burning hours, regardless of many times the lights are switched on and off. This is equivalent to a service life of around 10 years.

### What types of LED lighting systems are available?

There are currently three systems of LED lighting available:

- Assimilation lighting for crop growth
- Fixtures for multi-layered cultivation
- Cyclical lighting lamps

The LEDs provide diffuse lighting in the greenhouse. This means that every plant is provided with an equal

amount of light, resulting in uniform cultivation. The LEDs are available in blue, deep red and far red.

### How can I save energy with LED lighting?

- Since Lemnis Lighting uses only those colours that ensure maximum growth, less light is required.
- The LEDs in Lemnis Lighting are highly efficient and use less power than conventional lights.
- Since the LEDs in Lemnis Lighting do not radiate heat, no surplus heat is produced. This means less ventilation is required, which benefits the greenhouse climate and results in less heat loss.

- Since the plant temperature can be more effectively controlled, the plants use less energy for breathing, resulting in better growth.

- A Lemnis Lighting system emits diffuse light (approx. eight times more diffuse than conventional lighting).

**Did you know ...**

**depending on the system,  
a savings of 35-50% can  
be achieved?**





Scientific research has shown that diffuse light can increase production by as much as 10%.

- Since the Lemnis Lighting System has a highly compact design, fewer shadows are cast than with conventional lighting, resulting in more daylight, an important factor for growth.

#### Patent

Since the system is patented, Lemnis Lighting is the only lighting manufacturer in the market with this unique solution.

#### Is the $\mu\text{mol}/\text{sec}$ output of LED lighting equal to that of SONT?

No. Since Lemnis Lighting LEDs achieve the same production rate with less light, a lower light level is sufficient. At

numerous locations, comparable production has even been achieved with 1.5 to 1.7 times less light.

#### Control

Lemnis Lighting has developed a new concept for controlling its LED lighting systems. In addition to combination lights in which red and blue light are controlled simultaneously, the red and blue light can also be controlled separately, enabling growers to develop their own personal strategy.

#### Developing a lighting plan

A lighting plan is developed based on the crops grown in the greenhouse. Together we determine which type of lighting is most beneficial for your situation.

#### Financing options

An LED lighting system is a significant

investment. The purchase costs are often higher than with conventional lighting systems, but it is important to keep in mind the considerable energy costs that can be saved in the long term. A good, transparent financing structure can help lower the decision threshold and enable the purchaser to take immediate advantage of the savings that can be achieved with an LED system. Ask our staff about the financing options available for Lemnis LED lighting systems.

In response to growing demands for greenhouse lighting and lower energy consumption, the LED lighting system from Lemnis Lighting provides an abundance of opportunities for new, efficient and innovative lighting solutions. Request a quote today and discover the world of difference Lemnis Lighting makes!

lemnis  
lighting

Contact | Lemnis Lighting B.V. | [info@lemnislighting.com](mailto:info@lemnislighting.com) | [www.lemnislighting.com](http://www.lemnislighting.com)  
Remmingweg 2-4 | 1332 BE Almere | The Netherlands | T +31 36 529 0735 | F +31 36 529 0736