SYLVANIA

Lighting solutions for plant growth

SYLVANIA Horticulture Solutions

Light your world

A Success Story

The first SYLVANIA brochure on Gro-Lux® special lamps in 1964

Gro-Lux® Horticulture solutions

Following Sylvania's invention of the world's first light sources for plant growth in 1962, we have maintained a passion for excellence in product design and performance.

Our Gro-Lux® lamps have achieved among the highest sustained photosynthetic efficacies in the world and that same technical leadership has now been applied to LED technology.

SHP Gro-Lux®

GroXpress

1962

Gro-Lux® LED Linear

Gro-Lux® LED E27

SYLVANIA

Giving the sun a helping hand

Gro-Lux® Horticulture lighting

Light your world

Gro-Lux® is a plant growth lamp

A plant growth lamp is a lamp that produces the proper balance of different wavelengths needed for plant growth. It is designed to provide energy for plants, and for no other purpose.

today

The exponential growth of horticultural indoor farming

Importance of light

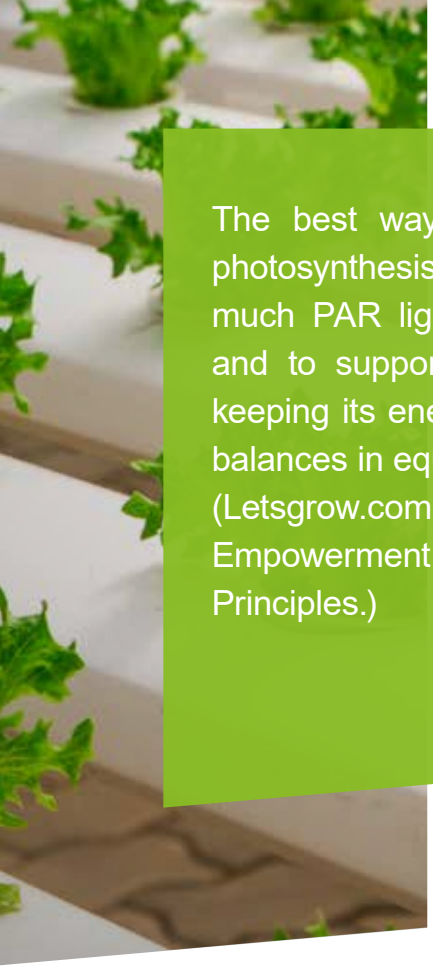
The demand for horticulture products has never been higher with growing populations, rising food prices and the desire for fresh, organic all year-round crops.

The rapidly exponential growth of horticultural indoor farming is due to increased modern requirements and demands. It gives growers control of year-round crops that are not affected by weather conditions and changing, and at times, extreme temperatures.

Food crops are just one of the many applications as the demand for out-of-season flowers and medicinal plants rises.

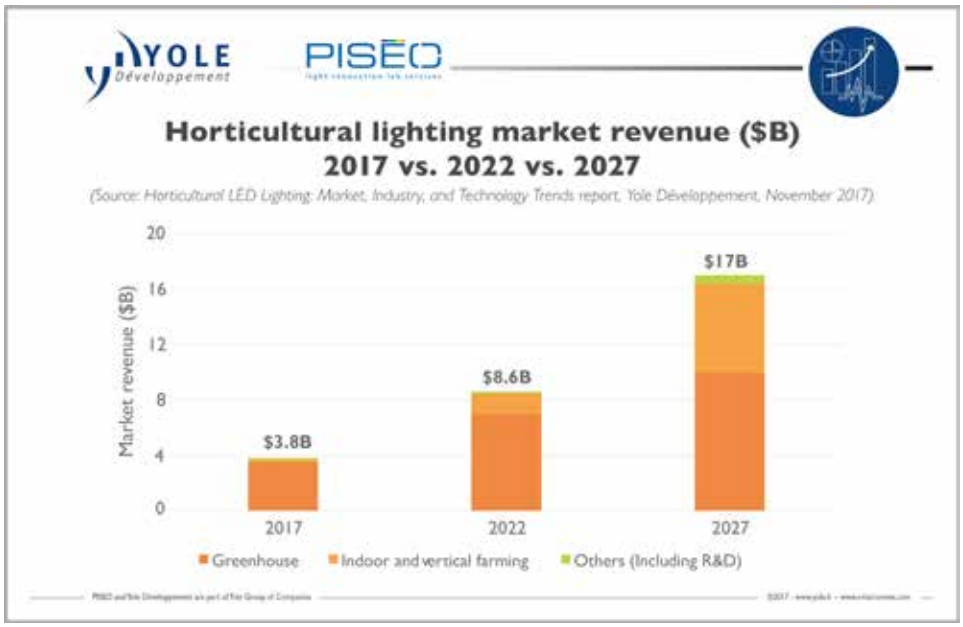
Colour and quality of light

The leaf of the plant is the ‘factory’ where the energy from light is absorbed and photo-chemically converted into sugars and oxygen. Leaves are green because the chlorophyll, a light absorbing pigment, is green of colour. At the same time that chlorophyll is rejecting green light, it is absorbing light in the blue and red areas of the spectrum. Besides chlorophyll there are other light absorbing/ photo-active pigments which absorb light in different colours.



The best way to maximize photosynthesis is to supply as much PAR light as possible and to support the plant in keeping its energy and water balances in equilibrium.
(Letsgrow.com (2018): Plant Empowerment. The Basic Principles.)

Photosynthesis is the starting point to optimize plant growth. In the Photosynthesis process CO_2 and water are photo-chemically converted into assimilates and oxygen. Assimilates are also referred to as carbohydrates or sugars. Assimilates are the building blocks for growth and provide the energy to keep the biochemical process inside the plant going. Therefore, the first step for optimal growth is the optimal production of assimilates , thus maximum utilisation of available PAR light from the sun or supplemental lighting such as High Pressure Sodium (HPS) lamps or LED.



In a global lighting market that is becoming increasingly competitive, horticultural lighting is seen by the LED lighting industry as a new opportunity for which to develop high added-value products. The 2016 horticultural lighting market (i.e. system level) represented a business of about US$3.1 billion. The current business is mostly driven by greenhouse applications and incumbent technologies, representing respectively 92% and 79% (in revenue) of the total market in 2017. However a transition to LED technology and the emergence of new applications will further increase this market's size and attractiveness, both at system and LED device levels.
(Yole Group of companies (2017): Horticultural LED Lighting: Market, Industry, And Technology Trends report)

Growth beyond the bounds of PAR

FullSpectrum+

Gro-Lux® LED spectrum delivers a plant specific full spectrum, which means it delivers not only light over the whole PAR spectrum but also beyond the boundaries of PAR lighting.

Numerous tests proved that not only the existence of certain wavelength is crucial for plant growth and flowering - but also the ratio between the given wavelength.

Gro-Lux® LED has the right proportion of needed wavelength including correct portions of Far-Red radiation. This brings the grower into the situation to only use one spectrum druring the whole growing process.

We specificly designed the spectrum of the Gro-Lux® to be the most efficient spectrum on the market - backed by recent scientific results such as DIN 5031-10:2018.

Gro-Lux® spectrum is one of the most plant efficient spectra available today.

The Gro-Lux® LED spectrum is a tailor made plant specific spectrum, designed for the highest plant specific efficiency and highest possible yields.

Blue Spectrum

Mainly active for vegetative growth. Blue has, for example, influence on the height and the morphology of the plant's leaves.

Green Spectrum

Most of the green light will be reflected. However small amounts of green light can enhance plant growth.

Gro-Lux® FullSpectrum+

Red Spectrum

Active for vegetative growth and flowering. Highest absorption wavelength for chlorophyll.

Far Red Spectrum

Low photosynthetic effect. Active for flowering. Important morphology effects.

We believe that a plant light should be 100% usable for the plant - this is why we do not waste energy in providing too high amounts of white light. This gives the light a more red view for the human eye.

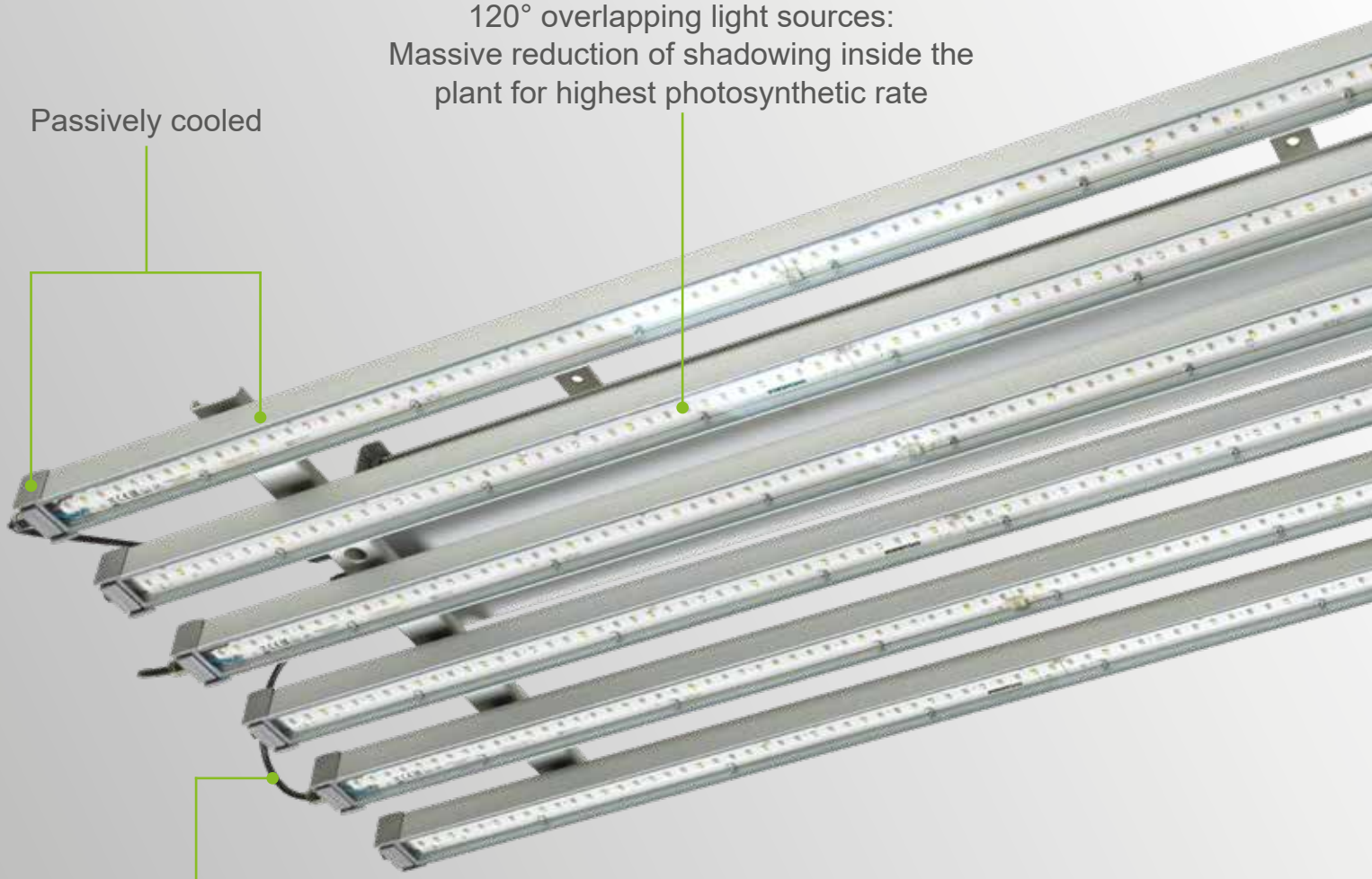
Studies found out that not just the availability of these spectra are important but also the ratios to each other.

The Gro-Lux® FullSpectrum+ combines all the needed spectra together.

If you want to know how Gro-Lux® LED Linear can increase your yield and enhance your plants do not esitate to contact one of our experts.

120° overlapping light sources:
Massive reduction of shadowing inside the plant for highest photosynthetic rate

Passively cooled



Heat and UV stable cables

Easy installation
and stable design

Membrane plugs:
Air circulation guaranteed. Waterproof

Gro-Lux® LED Linear

Made from anodized aluminium:
durable and corrosion-resistant material

Anti-reflective glass: Superior optical efficiency
performance boost of 6% compared to the competition

Emitters:
Highest quality LED chips

Long service life metal
hanger

Waterproof self locking plugs

Through wiring:
Allows connection of up to
6 fixtures in series possible

Flexibility:
Modular and upgradeable system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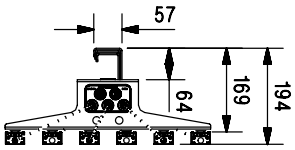
Gro-Lux® LED Linear

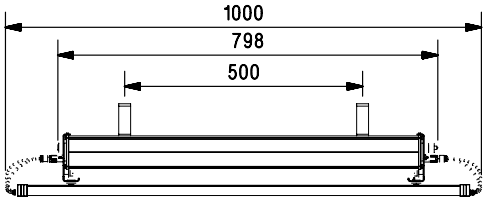
Features

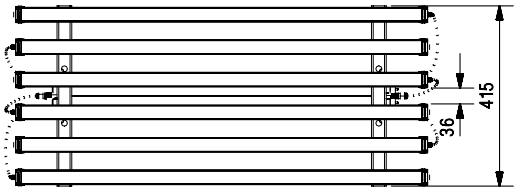
- Dimmable with separate controller
- Allows connection of up to 6 luminaires in series possible (Through wiring)
- Easy installation with the push-and-click system due to simple electrical and mechanical interfaces
- Passive cooling minimises heat generation
- Glass lenses - easy cleaning and no aging
- Life at TA=25oC (hrs): 50,000 L_{90}

Applications

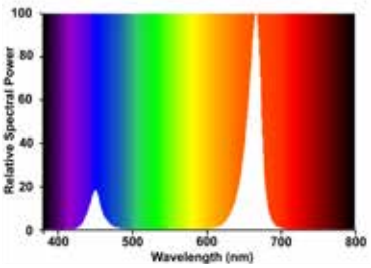
- Greenhouses
- Flower plant houses
- Domestic plant growth facilities



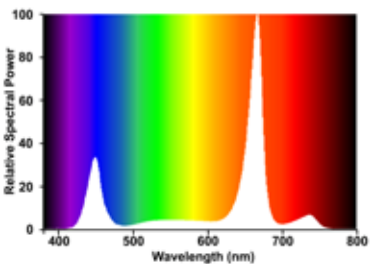




Gro-Lux® LED Vegetative



Gro-Lux® LED Full Spectrum+



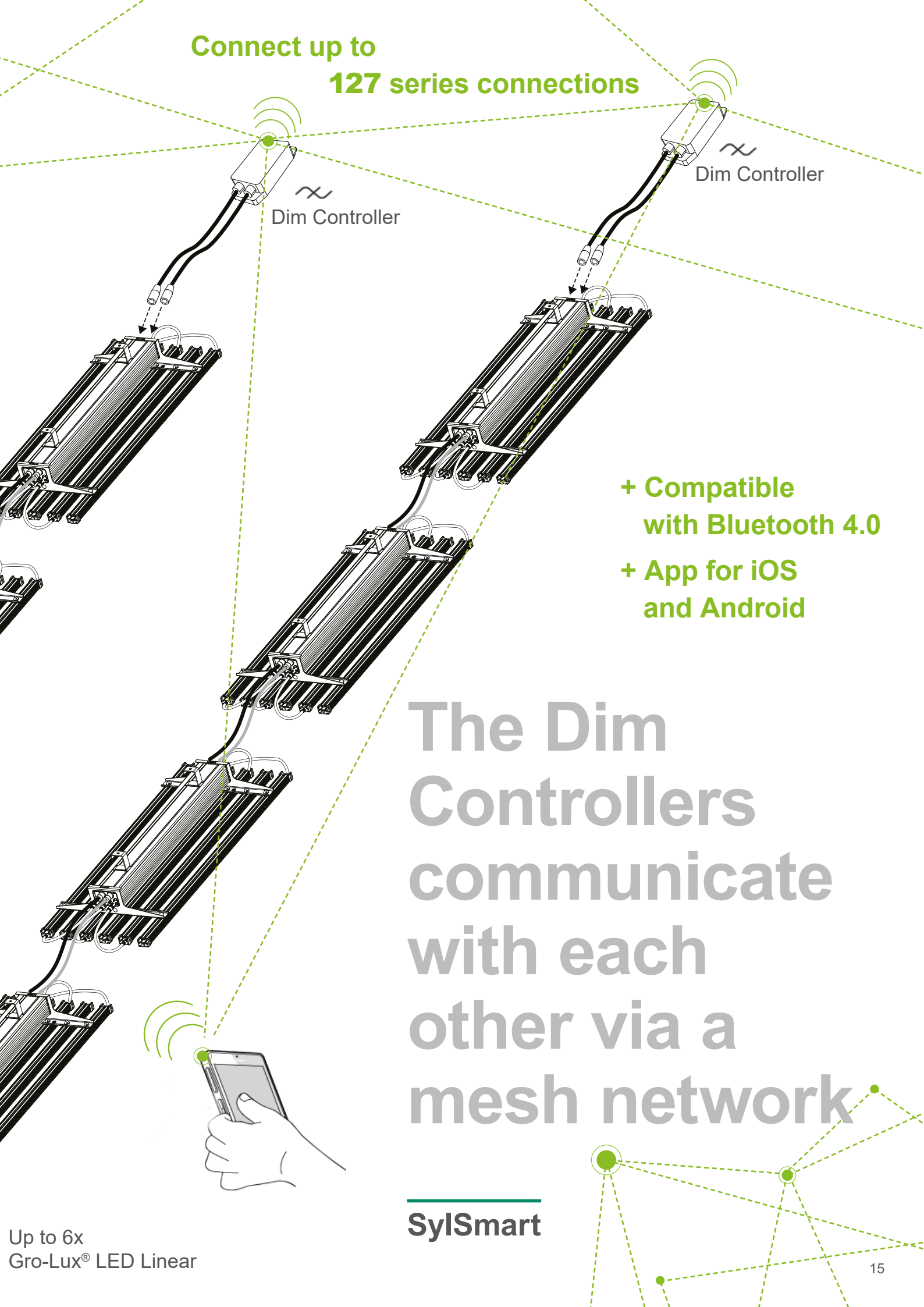
Code	Item description	Spectrum	Watt (W)	Volt (V)	Beam Angle (°)	Phytosyn. Flux – PF (phytolumen)	PAR (µmol/s)	Biologically Active Photon Efficacy (µmol/J)	Lifetime at Ta 25°C (hrs)	Packaging Quantity (pcs)
Gro-Lux® LED Linear Modules										
0020913	Gro-Lux® LED linear Vegetative	Red/Blue (85%/15%)	59	42	120	34,000	180	3.06	50,000	1
0020914	Gro-Lux® LED linear Full Spectrum+	Universal Red/Blue/ White/Far Red	66	47	120	27,000	150	2.51	50,000	1
Gro-Lux® LED Linear Frames										
0020909	Gro-Lux® LED linear frame 4x	-	-	-		-	-	-	-	1
0020910	Gro-Lux® LED linear frame 6x	-	-	-		-	-	-	-	1
Gro-Lux® LED Linear Accessories										
0020920	Dim Controller Gro-Lux® LED	-	-	-		-	-	-	-	1

Dim Controller

Connection of up to 6 luminaires in series

Through Wiring

From small greenhouses to large industrial installations Gro-Lux® offers the solution. Through Wiring enables you to connect up to 6 luminaires to one power socket.


Connect up to
127 series connections
Dim Controller
Dim Controller
+ Compatible
with Bluetooth 4.0
+ App for iOS
and Android
The Dim
Controllers
communicate
with each
other via a
mesh network
SylSmart
Up to 6x
Gro-Lux® LED Linear

The LED growth lamp

Gro-Lux® LED E27

Gro-Lux® LED E27

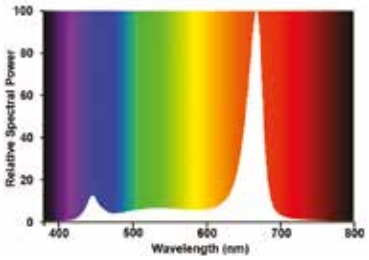
Features

- Fits in every common E27 base (120–240V)
- IP44 rated
- Low power consuption of 17W
- Two different spectra available
- Vegetative spectrum provides perfect lighting for small plants supports the growth phase
- Flowering spectrum offers great supplemental light for the flowering stage
- Best in class output
- Photosynthetic efficacy up to 2.3µmol/J
- 25,000hrs L70B50 flux maintenance

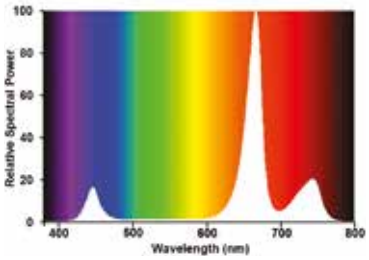
Applications

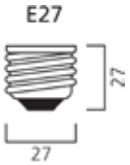
- Photoperiodic lighting
- Propagation
- Night-interruption
- Additional lighting for motherplants

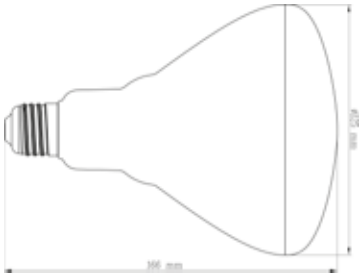
Gro-Lux® LED Vegetative



Gro-Lux® LED Flowering







Code	Item description	Spectrum	Watt (W)	Volt (V)	Beam angle (°)	PAR (µmol/s)	Photosyn. Efficacy (µmol/J)	Photosyn. Photon Flux Density – PPFD at 1m (µmol/s/m2)	Lifetime at Ta 25°C (hrs)	Packaging Quantity
0020965	Gro-Lux® LED E27 Vegetative	White and Deep Red	17	120-240	115	39	2.3	13	25,000	1
0020966	Gro-Lux® LED E27 Flowering	White, Blue, Deep Red and Far Red	17	120-240	115	31	1.8	10	25,000	1

The Gro-Lux® LED E27 series offers a complete range of lamps for horticulture. With two main spectrum for vegetative and flowering applications, Sylvania horticulture LED lamps have one of the highest PPF values on the market with up to 38.9µmol/s.

SHP-TS Gro-Lux®

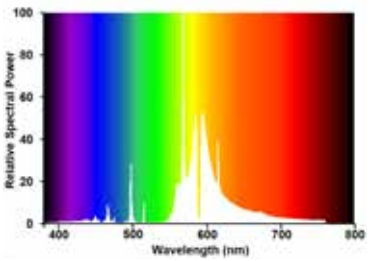
Sylvania Gro-Lux® lamps are among the world's most powerful plant growth lamps with the best photosynthetic efficacy. The patented burner enables SHP Gro-Lux® lamps to efficiently convert electrical energy into photosynthetically active radiation. Due to the specially developed Gro-Lux® spectrum, the lamps are particularly suitable for all stages of plant growth.

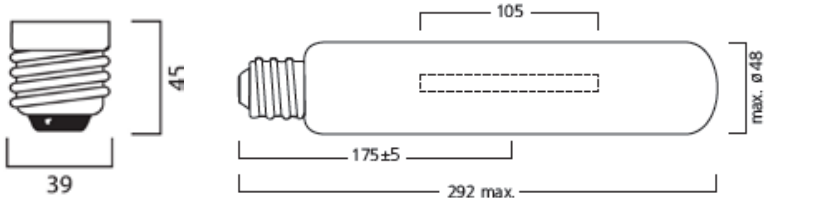
Features

- Delivers high photosynthetic efficiency
- The light spectrum of Gro-Lux® maximises red output essential for plant growth
- Suitable for a plethora of applications related to plant growth
- Optimised for high phytolumens and PAR output

Applications

- Greenhouses
- Flower Plant Houses
- Domestic plant growth facilities





Code	Item description	Socket	Watt (W)	Volt (V)	Amp (A)	Mains Voltage (V)	PAR (µmol/s)	Visible lumens (lm)	Phyto-lumens	Efficiency (PAR/W)	Packaging Quantity
0020819	SHP-TS Gro-Lux® E40 250W	E40	265	115	2.6	230	425	34,000	75,500	1.68	12
0020807	SHP-TS Gro-Lux® E40 400W	E40	425	120	4.0	230	713	58,000	128,000	1.68	12
0020808	SHP-TS Gro-Lux® E40 600W	E40	615	125	5.5	230	1,100	90,000	200,000	1.79	12
0020809	SHP-TS Gro-Lux® E40 600W 400V	E40	620	200	3.5	400	1,180	88,000	215,000	1.90	12

SHP-T GroXpress

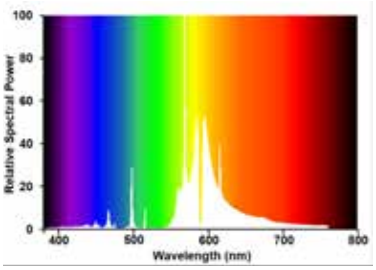
Sylvania's GroXpress is an ideal solution for small and medium scale greenhouses and domestic plant growth facilities for flowering plants and vegetables. It also provides an opportunity for out of season crops. SHP-T GroXpress is optimized for high Phytolumens and its light spectrum maximises red output which is essential for plant growth.

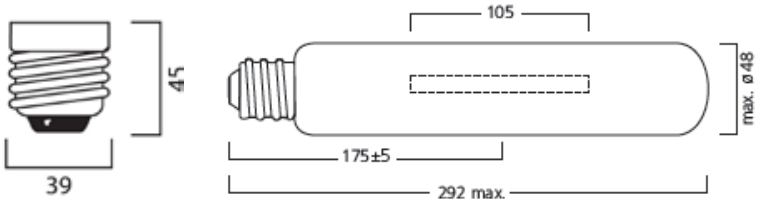
Features

- Delivers high photosynthetic efficiency
- GroXpress light spectrum maximises red output essential for plant growth
- Suitable for a plethora of applications related to plant growth
- Optimised for high phytolumens or PAR output

Applications

- Greenhouses
- Flower Plant Houses
- Domestic plant growth facilities





Code	Item description	Socket	Watt (W)	Volt (V)	Colour Temp. (K)	PAR (µmol/s)	Light Output (lm)	Phyto-lumens	Efficiency (PAR/W)	Packaging Quantity
0020816	SHP-T GroXpress E40 250W	E40	250	100	2,000	370	33,000	66,000	1.48	12
0020817	SHP-T GroXpress E40 400W	E40	400	100	2,000	640	55,000	115,000	1.60	12
0020818	SHP-T GroXpress E40 600W	E40	600	115	2,050	950	90,000	165,000	1.58	12

The way to your horticulture solution by SYLVANIA

1

Start Up Meeting

We start with a discussion of your requirements to find the best solution to your challenge and the best way to bring you to your goal.

2

Product Test

We setup a field trial, an usual time for the test is up to 6 months. This gives you enough time to truly test the setup on your application.

3

Audit

We are at your side to assist with the new setup. Not only from the lighting standpoint, but also with a look on all factors involven in growing.

4

Economic Aspect

You have to be successful. Not only has the setup fullfill your needs, it has to make sense - economically. This is when Sylvania Logic comes into account. Logic answers your financial and business needs: no upfront capital needed, guaranteed return on investment and performance and saving tracking.

5

Final Phase

Finish the setup. If you are satisfied with the implementation, when the economical value is clear and everything is running, then we call it a success.

Symbols and definitions

Horticultural product.

The product contains LED technology.

Not suitable for household illumination.

Ingress protection rating (IP). The first number indicates the measure of protection against the ingress of solids. The second number indicates the measure of protection against the ingress of liquids.

This product is mains dimmable.

3 Year Warranty.

Product conforms to all requirements from European directives.

Candela (cd)
The unit of measurement for luminous intensity, which refers to the quantity of light emitted in a particular direction. The symbol is cd.

Chlorophyll
It is a green pigment which is the most abundant in plants. Chlorophyll captures mostly red and blue light for the photosynthesis process allowing plants to absorb energy from light.

Colour Temperature / Correlated Colour Temperature (CCT)
Correlated Colour Temperature (CCT) is a measure of light source colour appearance defined by the position of the light source's chromaticity coordinates along the Planckian locus or blackbody locus.

Colour Rendering Index (CRI)
The colour rendering of a light source is an indicator of its ability to realistically reproduce the colour of an object. The higher the colour rendering index (on a scale up to a maximum of 100) of the source, the better our ability to perceive differences in colour.

Luminous flux
Luminous flux is the total light output of a light source. It is measured in lumens (lm).

Lumen (lm)
Unit of luminous flux used to describe a quantity of light emitted by a source.

Luminous efficacy (lm/W)
Indicates how efficiently a light source converts electrical energy to light. It is the ratio of luminous flux to power.

Mole (mol)
It is a unit of measurement which indicate the amount of a substance. It is used in horticulture to quantify the amount of active light generated by a lighting system or which reach a target area.

Photosynthesis
This is the process used by plants to convert light into energy. Chlorophyll plays an important role in this process.

Photosynthetic Active Radiation (PAR)
PAR light is the wavelengths of light within the visible range of 400 to 700 nanometers (nm) which is used by plants in the photosynthesis process.

Photosynthetic Photon Flux (PPF)
This is a measurement that determines the total amount of photosynthetic active radiation (PAR) produced by a lighting system. PPF is expressed in µmol/second.

Photosynthetic Photon Flux Density (PPFD)
This is a measurement of the amount of photosynthetic active light that reach a target area. PPFD is expressed in µmol/second/m2.

Photonsynthetic Efficiency (µmol/W or µmol/J)
It shows the luminous efficacy of a lighting system to convert electrical energy into active light.

McCree curve
Dr. K J McCree was a scientist who performed several studies in the 1970s to determine the influence of light spectra on photosynthesis. In his work "The action spectrum, absorptance and quantum yield of photosynthesis in crop plants"-1972, Dr. Keith McCree created a relation in between photosynthetic efficiency and the light spectrum which is known as the McCree curve.

Spectral Power Distribution (SPD)
The Spectral Power Distribution curves gives a visual profile of the colour characteristics of a light source. It describes the power per unit area per unit wavelength of an illumination.

SYLVANIA

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