

SYLVANIA



Giving the sun a helping hand

Gro-Lux® Horticulture lighting

Light your world

Stimulating growth since 1962

Gro-Lux® Horticulture solutions



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

Why Gro-Lux® Horticulture Solution?

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.



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 changeable, 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.



We turn light into food

Importance of light

Light is the energy that is needed by plants to produce food and other nutrients required for growth and flowering. Plants are unique in that they are the only organisms that can convert light into food. The process is called photosynthesis.



Gro-lux® is a plant growth lamp

A plant growth lamp is a lamp that produces the proper balance of blue and red energy needed for plant growth, and has its major output in these two regions. It is designed to provide this energy for plants, and for no other purpose.

Colour or quality of light used

The leaf of the plant is the 'factory' where the energy from light is absorbed and converted to food. Leaves are green because the chlorophyll, which is the light absorbing pigment, is of green colour. We are able to see this green colour because the leaves reject the green light by reflection. At the same time chlorophyll is rejecting green light, it is absorbing light in the blue and red areas of the spectrum. The requirement for red light is generally greater than that for blue, so it is essential to have a correct balance of energy in red and blue portions of the spectrum.

For normal growth, plants require a balance of blue and red energy in a light source. Red light provides energy for both photosynthesis and chlorophyll synthesis. Red energy tends to promote seed germination, seedling and flowering.

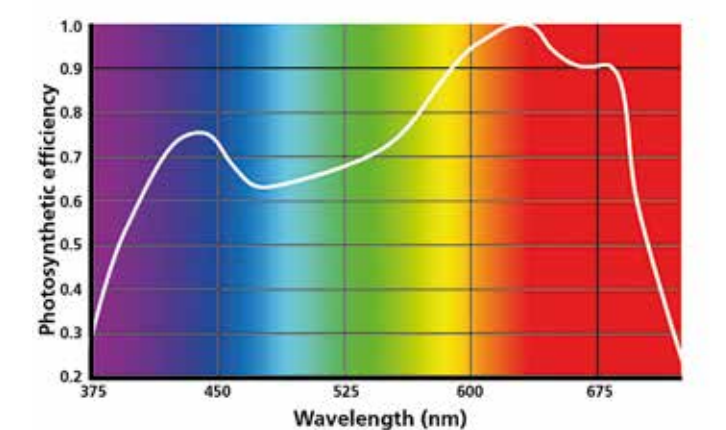
Quantity or intensity of light

In addition to requiring the proper light colour, plants also require different quantities or intensities of light. Plants which normally grow in full sun light require higher intensities of light than plants that normally grow in shade or semi shade.

The light intensity is described in terms of a spectral power distribution (SPD), which measure the power per unit area per unit wavelength of an illumination.

In 1972, the contribution of Dr. McCree on photosynthesis in crop plants which put in light the spectrum of plant as a function of light energy to the different wavelength of light. This is commonly named as the McCree curve.

McCree curve





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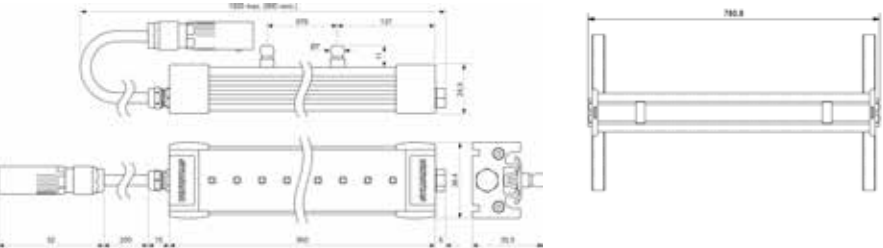


The modular horticulture system

Gro-Lux LED® Linear

Plant growers need flexibility from their horticulture lighting systems to meet plant growth needs and to maximise yields. For any type of installation, from small greenhouse facilities to large scale installations or for indoor farming projects, the modularity of the Gro-Lux® LED Linear is the solution for you. The Gro-Lux® LED modules can be used on their own, or fixed to the Gro-Lux® LED frames for a maximum output on top lighting installations.

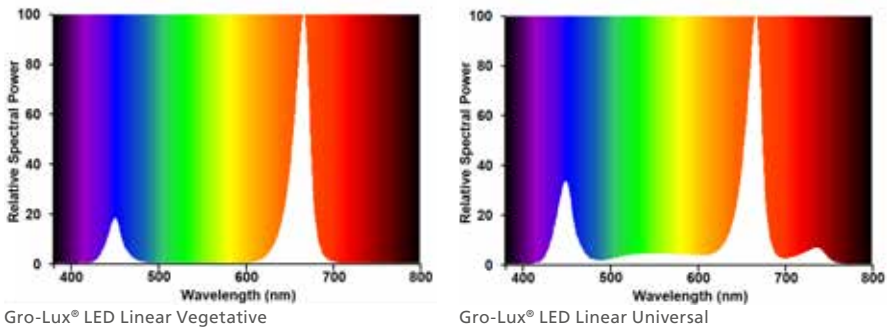
Dimensions (mm)



Features

- Easy to install thanks to simple electrical and mechanical interface
- Very high efficacy up to 3.06µmol/J
- IP66 sealed with water vapour ingress protection
- Glass lenses do not degrade, easy to clean
- Anti-reflection coated glass for ultimate output

Spectral data



Gro-Lux® LED Modules

Code	Description	Spectrum	Wattage (W)	Voltage (V)	Frequency (Hz)	Beam angle (°)	Photosynthetic Flux – PF (phytolumen)	PAR (µmol/s)	Photo-synthetic Efficacy (µmol/J)	Photosynthetic Photon Flux Density – PPFD @1m (µmol/s/m²)	Life at Ta=25°C (hrs)	Packing unit
0020913	Gro-lux® LED linear vegetative R85%	Red/Blue (85%/15%)	59	42	DC	120	34000	180	3.06	57	50,000 L ₇₀	1
0020914	Gro-Lux® LED linear universal	Universal Red/Blue/White/Far Red	66	47	DC	120	27000	150	2.28	48	50,000 L ₇₀	1
0020915	Gro-Lux® LED linear vegetative R85%	Red/Blue (85%/15%)	59	42	DC	120	34000	180	3.06	57	50,000 L ₇₀	6
0020916	Gro-Lux® LED linear universal x3	Universal Red/Blue/White/Far Red	66	47	DC	120	27000	150	2.28	48v	50,000 L ₇₀	6

Gro-Lux® LED Frames

Code	Description
0020909	Gro-Lux® LED linear frame 4x
0020910	Gro-Lux® LED linear frame 6x

Comments

Vegetative Spectrum	Narrow spectrum Red/Blue (85%/15%). Optimised for maximum efficacy vegetative growth, only for supplementary lighting with natural sunlight.
Universal Spectrum	Wide Spectrum Red/Blue/White/Far Red. A Universal light source for all stages of plant growth, optimised for applications without natural sunlight.

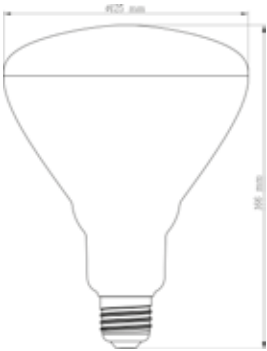


The LED plant growth lamp

Gro-Lux® LED E27

The Gro-Lux® LED E27 series offers a complete range of lamps for horticulture. With two main spectra 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 and an efficacy up to 2.25 µmol/J.

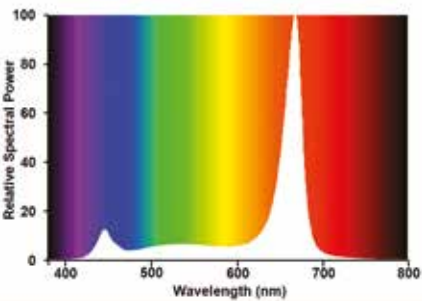
Dimensions (mm)



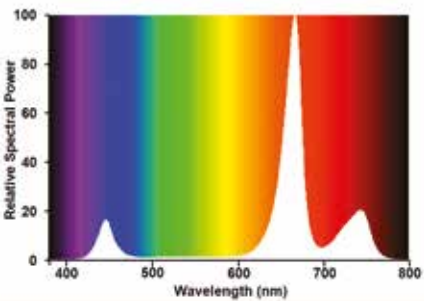
Features

- E27 base/ 120–240V
- IP44 rated
- 17W for both spectrum
- Photosynthetic efficacy up to 2.3µmol/J
- 25,000hrs L₇₀B₅₀ flux maintenance

Spectral data



Gro-Lux® LED Vegetative



Gro-Lux® LED Flowering



Code	Description	Spectrum	Wattage (W)	Voltage (V)	Frequency (Hz)	Beam angle (°)	PAR (µmol/s)	Photosynthetic Efficacy (µmol/J)	Photosynthetic Photon Flux Density – PPFD at 1m (µmol/s/m2)	Photosynthetic Photon Lifetime at Ta 25°C (hrs)
0020965	Gro-Lux® LED E27 Vegetative White and Deep Red		17	120–240	50–60	115	39	2.3	13	25,000 L ₇₀ B ₅₀
0020966	Gro-Lux® LED E27 Flowering White, Blue, Deep Red and Far Red		17	120–240	50–60	115	31	1.8	10	25,000 L ₇₀ B ₅₀



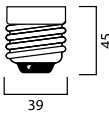
We nurture, perform and energise

Gro-Lux® and GroXpress Sodium Lamps

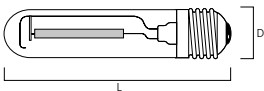
The Sylvania Gro-Lux® and GroXpress SHP series, are extremely high performing plant growth lamps. Thanks to a patented arc tube design, Gro-Lux® SHP lamps have the most efficient conversion of electrical energy into Photosynthetically Active Radiation. The GroXpress range offers the ideal solution for small to medium scale greenhouses and domestic plant growth facilities.

Dimensions (mm)

E40



SHP-TS GroXpress



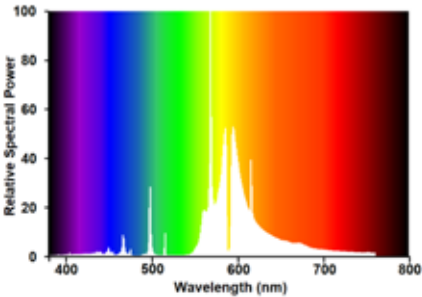
SHP-T GroXpress	250W	400W	600W
L	260	292	292
D	48	48	48

SHP-TS Gro-Lux®	250W	400W	600W
L	260	267	267
D	48	48	48

Features

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

Spectral data



Code	Description	Bulb finish	Bulb shape	Wattage (W)	Voltage (V)	Lamp base	Colour temperature (K)	PAR (μmol/s)	Luminous flux (lm)	Phyto-lumens	Efficiency (PAR/W)	Energy class	Average rated life (Hrs)
0020816	SHP-T 250W GroXpress E40	Clear	Tubular	250	100	E40	2000	370	33000	66,000	1.48	A++	24,000
0020817	SHP-T 400W GroXpress E40	Clear	Tubular	400	100	E40	2000	640	55000	115,000	1.60	A++	24,000
0020818	SHP-T 600W GroXpress E40	Clear	Tubular	600	115	E40	2050	950	90000	165,000	1.58	A++	24,000

Cap: E40 Box quantity: 12

Code	Description	Bulb finish	Bulb shape	Wattage (W)	Voltage (V)	Amp (A)	Mains voltage	PAR (μmol/s)	Visible lumens	Phyto-lumens	Efficiency μmol/W	Energy class	Average rated life (Hrs)
0020819	SHP-TS Gro-Lux® 250W	Clear	Tubular	265	115	2.6	230V	425	34,000	75,500	1.68	A+	26,000
0020807	SHP-TS Gro-Lux® 400W	Clear	Tubular	425	120	4.0	230V	713	58,000	128,000	1.68	A++	26,000
0020808	SHP-TS Gro-Lux® 600W	Clear	Tubular	615	125	5.5	230V	1100	90,000	200,000	1.79	A++	26,000
0020809	SHP-TS Gro-Lux® 600W-400V	Clear	Tubular	620	200	3.5	400V	1180	88,000	215,000	1.90	A++	26,000
0020826	SHP-TS Gro-Lux® 600W EL 400V*	Clear	Tubular	605	210	2.9	400V	1170	88,000	215,000	1.93	A++	26,000

Cap: E40/45 Box quantity: 12

* Lamp in development. Technical details TBC





Symbols and definitions



Product conforms to all requirements from European directives.



European Norms Electrical Certification.

ISO 9001

Criteria for a quality management system.



Class I – Luminaire constructed according to earthed electrical grounding specifications.



Class II – Luminaire that comply with class II double insulated electrical requirements.



Class III – Luminaire that comply with class III triple insulated electrical requirements.



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.

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 $\mu\text{mol}/\text{second}$.

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 $\mu\text{mol}/\text{second}/\text{m}^2$.

Photonsynthetic Efficiency ($\mu\text{mol}/\text{W}$ or $\mu\text{mol}/\text{J}$)

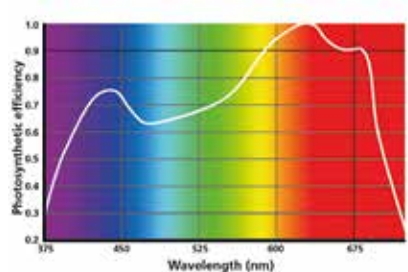
It shows the luminous efficacy of a lighting system to convert electrical energy into active light.

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.



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Although every effort has been made to ensure accuracy in the compilation of the technical detail within this publication, specifications and performance data are constantly changing. Current details should therefore be checked with Feilo Sylvania Europe Limited.

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