



PHILIPS


Horticulture
LED Solutions

GreenPower
LED string



The benefit of LED lighting in **multilayer** **cultivation**

Helping your business to blossom



Philips GreenPower **LED string**

“

The GreenPower LED string has a flexible design, offering maximum freedom in installation”

Building upon our long history of developing innovative and reliable lighting for the horticultural market, we are delighted to introduce our GreenPower LED string. Featuring state-of-the-art LED technology, this string is designed for multilayer applications requiring low GrowthLight levels, e.g. for tissue culture, storage and transport of plants.

Philips GreenPower LED string enables a uniform light distribution across the shelves, ensuring that every crop receives the same level and quality of light, regardless of its position on the surface. The red and blue light of the GreenPower LED string, while less visible to the human eye, provides the colors most essential for crop growth.



GreenPower LED string combines a **homogeneous light level with low energy consumption**

Tune the light

With the GreenPower LED string, you can decide for yourself how much red and how much blue light you want – something that is not possible with fluorescent lamps. In this way, you can truly tune the light to meet the specific needs of each crop.

Increased efficiency

GreenPower LED string combines a homogeneous light level with low energy consumption, making it a cost-effective solution compared with today's fluorescent lamps. It also radiates less heat, enabling you to bring the light closer to the crop and so increase the number of cultivation layers.

Flexibility and convenience

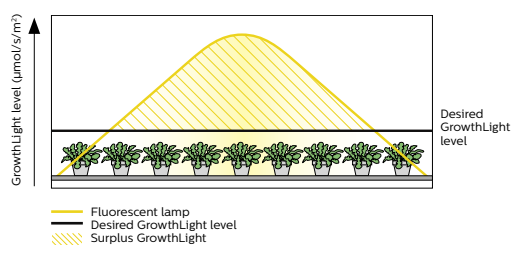
The GreenPower LED string has a flexible design, offering maximum freedom in installation. It is also robust, waterproof and easy to clean – you can simply wash down your multilayer array. Combined with the long lifetime of LEDs, this will limit failures and therefore maintenance costs.

Application areas*

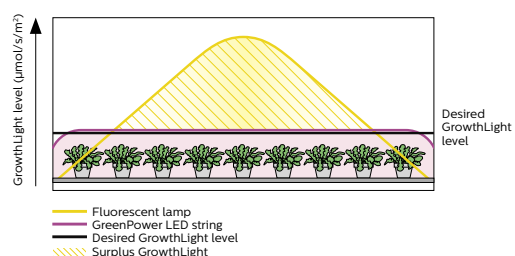
- Tissue culture (in vitro multiplication and propagation of young plants)
- Plant storage and transport
- Plant research

* The typical GrowthLight is between 5 and 25 $\mu\text{mol/s/m}^2$. Depending on the configuration, higher or lower lighting levels are possible.

Current situation GrowthLight distribution – fluorescent lamps



Comparison GrowthLight distribution – fluorescent lamps versus GreenPower LED string



In today's situation, the light from fluorescent lamps is often not sufficient at the edges, while delivering a surplus in the middle. With the GreenPower LED string you can install a uniform light level close to the level that the plant actually requires.

Proven in practice

Since light is an important production tool for growers and breeders, Philips has conducted several field tests together with horticultural firms and experts from the research community. These tests prove the cost-effective potential of LED solutions to optimize crop yield and quality.



Field test **Peerdeman Orchideeën**

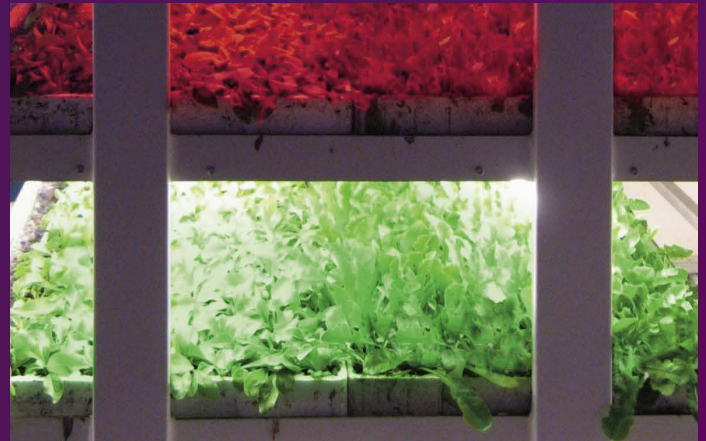
Philips and Peerdeman Orchideeën, an important supplier of various orchids, carried out extensive tests on tissue culture. By varying the light level and color ratio, an optimum was found for Phalaenopsis and Cymbidium.

Results

- Appearance of plants – the same or even better
- Improved light uniformity
- Up to 50% reduction in energy consumption

“We were surprised to discover that LEDs really do make a difference. The flexibility to optimize the different factors – spectrum, uniformity and heat distribution – ensures the ideal solution. For us and the plants!”

Arjen Peerdeman, Peerdeman Orchideeën



Field test **Royal van Zanten**

At Royal van Zanten, an innovative and leading company of plant material, tests were conducted on tissue culture for Chrysanthemums and Alstroemeria and cold storage of several Limonium varieties.

Results

- Chrysanthemum – higher propagation factor
- Storage – healthy plants and less evaporation
- Up to 60% energy savings in tissue culture and up to 80% in storage

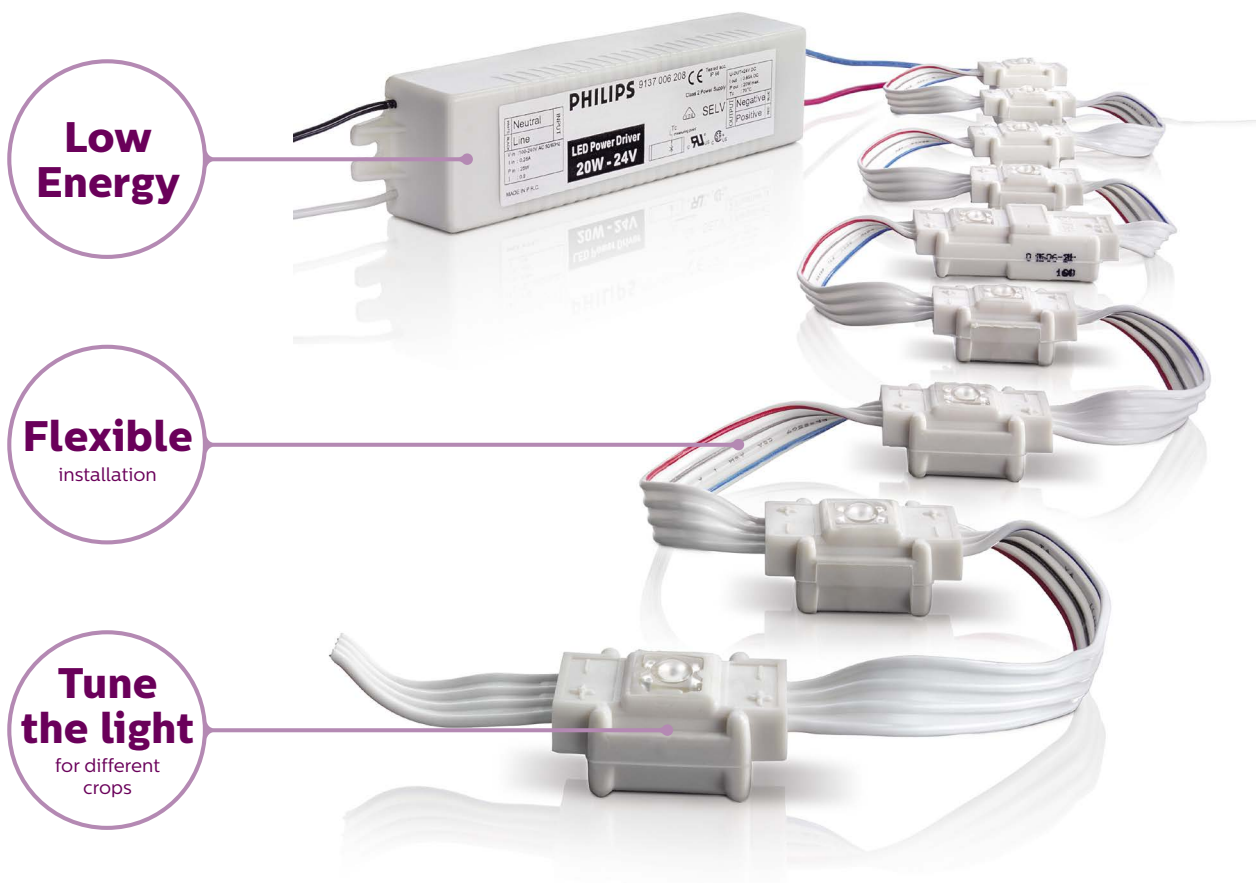
“In our company we saw lots of opportunities for LEDs. By carrying out tests, we found solutions for both tissue culture and plant storage. As well as saving energy, LEDs help us to improve plant quality during cold storage, mainly thanks to better heat control.”

Sjoukje Heimovaara, Royal van Zanten

Philips GreenPower LED string

Maximum freedom in installation

Philips GreenPower LED string enables a uniform light distribution across the shelves, ensuring that every crop receives the same level and quality of light, regardless of its position on the surface. The red and blue light of the GreenPower LED string, while less visible to the human eye, provides the colors most essential for crop growth.



Specification

Specification per meter GreenPower LED string (=10 LEDs)*	Photon flux (typical)	Power consumption (typical)	Lifetime**	Photon flux maintenance	Ingress protection
	[$\mu\text{mol/s}$]	W	hours	%	IP
GreenPower LED string deep red	5.5	3.5	25,000	90%	66
			50,000	70%	
GreenPower LED string blue	1.4	1.4	25,000	90%	66
			50,000	70%	
GreenPower LED string white	2.7	1.9	25,000	90%	66
			50,000	70%	
GreenPower LED string far red	1.5	0.9	25,000	90%	66
			50,000	70%	

* Example: 10 $\mu\text{mol/s}$ red light for one square meter requires 1.8 meters of GreenPower LED string MF deep red, depending on the configuration requirements.

** Lifetime and maintenance values are given at an ambient temperature of 25 °C.

Note: The GreenPower LED string is designed for a shelf distance of 50 cm.

Wiring AWG 26 (0.405 mm, 0.129 mm²) – Quantities per LED driver and per branch

GreenPower LED string low power	Max nr. of LEDs	Cable between power driver and first LED (LED driver device) of the string											
		0 meter			10 meter			20 meter			30 meter		
		LED Power Driver			LED Power Driver			LED Power Driver			LED Power Driver		
		20 W	60 W	100 W	20 W	60 W	100 W	20 W	60 W	100 W	20 W	60 W	100 W
White	per driver ¹	85	250	395	75	95	95	45	45	45	30	30	30
	per branch ²	80	140	140	70	70	70	45	45	45	30	30	30
Blue	per driver ¹	95	280	375	75	75	75	40	40	40	25	25	25
	per branch ²	90	125	125	60	60	60	35	35	35	25	25	25
Deep red	per driver ¹	65	195	310	55	80	80	40	40	40	25	25	25
	per branch ²	65	130	130	55	65	65	35	35	35	25	25	25
Far red	per driver ¹	95	280	375	75	75	75	40	40	40	25	25	25
	per branch ²	90	125	125	60	60	60	35	35	35	25	25	25





Per driver ¹ per driver the nr. of LEDs divided over the branches may not be exceeded and

Per branch ² if more branches (upto three) are used the nr. of leds per branch may not be exceeded

Note: if you want to apply more than three branches, please contact your local Philips office.

Ordering information

Philips GreenPower LED string is designed to operate with Philips LED power drivers to ensure optimal performance. Please contact your local sales office for more information.

Philips GreenPower LED string	Minimum order quantity	Ordering code	
		12NC	6NC
GreenPower LED string deep red 	1x20 m	9290 004 85103	271833
GreenPower LED string blue 	1x20 m	9290 004 84903	271841
GreenPower LED string white 	1x20 m	9290 004 85003	271858
GreenPower LED string far red 	1x20 m	9290 006 95503	

Philips Power Driver (IP66)	Minimum order quantity	Ordering code
		12NC
20W-24V, 100-240V	10	9137 006 20891
60W-24V, 100-240V	10	9137 006 20991
100W-24V, 100-240V	10	9137 006 21091
LED GreenPower NAM driver		
100W-24V, 100-240V	10	4435 290 30411

Compliances and approvals

Approval mark ENEC

RoHS-compliant

Quality standard ISO 9001-2000

Environmental standard ISO 14001

Accessories	Minimum order quantity	Ordering code	
		12NC	6NC
LS Mounting Clip	200	9290 001 16903	214320
LS Extension Cable 4Wg 24	75 m	9290 004 62603	214312
LS Mounting Tape 210 pads	1 reel of 210 pads	9290 001 17803	214338
LS Mounting Tape 1700 pads	1 reel of 1680 pads	9290 001 17903	214262
LS Connector Xtend	10	9290 004 86203	247767
LS Connector End cap	10	9290 004 86403	247775



More than a product, it's a complete solution

The Philips GreenPower LED string offers all the proven benefits of LED technology and – as a complete solution – much more besides.

- Quick and easy installation
- Support and advice from technical experts
- Advice on which lighting strategies are best for your situation



© 2015 Royal Philips N.V. All rights reserved. Philips reserves the right to make changes in specifications and/or to discontinue any product at any time without notice or obligation and will not be liable for any consequences resulting from the use of this publication.

Document order number: 3222 635 68076
03/2015
Data subject to change

For more information about
Philips horticulture LED Solutions visit:
www.philips.com/horti

Write us an e-mail:
horti.info@philips.com

Or tweet us:
[@PhilipsHorti](https://twitter.com/PhilipsHorti)