HORTILED

HLAC-series lamps for industry

WHY HLAC-SERIES LAMPS

Created through years of advanced scientific research

Tested for efficiency at industrial greenhouses

Provide optimal lighting intensity using at least 3 times less energy than HPS lamps

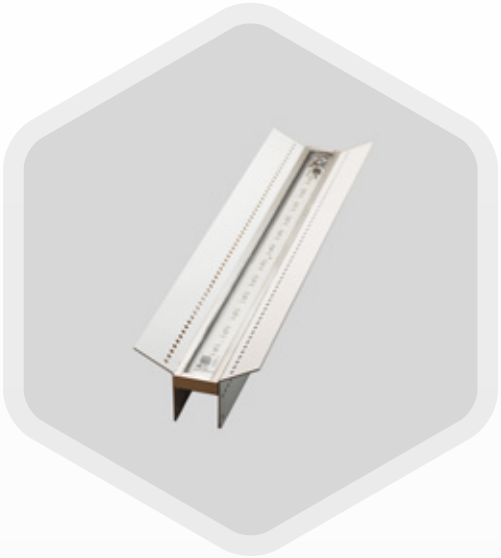
Produce stronger and better-developed plant roots

Improve fertilizer utilization rates

Suitable for the majority of plants, with custom spectral solutions also available

Technical Specifications

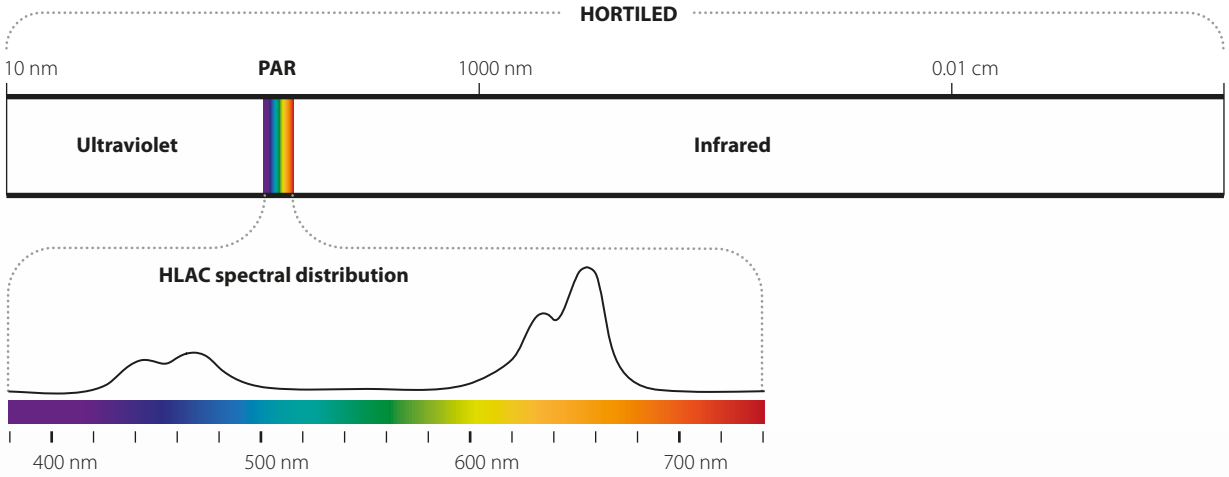
Application	LED-based plant lighting system for plant factories and phytotrons
Functionality	• Light spectra according to customer specifications • Free-air convection • Suitable for cultivation in racks
Advantages	• Extreme energy efficiency • Fast and convenient mounting • Optimal lighting intensity • 24-month warranty
Length/Width	200/50 mm
Weight	4.8 kg
Operating temperature	0 – + 50 °C
Operating humidity	< 90 %
Photosynthetic photon flux density (lamp height)	130 µmol m^{-2} s^{-1} (50 cm)
Iluminated area (lamp height)	1.50 m^2 (50 cm)
Spectral information	Wave length of red LEDss: 662 nm Share of total photon flux: 80% Wave length of blue LEDs: 451 nm Share of total photon flux: 20%



WHY LED

Electric lamps have been used to grow plants for nearly 150 years. They've followed a development paths from incandescent lighting, open arc lighting and enclosed gaseous discharge lamps to the high-pressure sodium (HPS) lamps which are still the most common choice for supplemental lighting in greenhouses. These lamps emit light in the visible **(400-700 nm)** and the invisible **(700-850 nm)** ranges, but with peak emission in the yellow/orange light **(~589 nm)** region. The high amount of yellow light, along with a deficiency of blue light, causes stem elongation in plants and worsens transplant quality.

Solid-state lighting using light-emitting diodes (LEDs) represents a fundamentally different technology from the HPS-type lamps currently used in horticulture. It offers many advantages over traditional forms of lighting. These optoelectronic devices feature excellent energy efficiency, high photo-biological efficacy, long life, a cool emitting temperature, a relatively narrow emission spectrum, and a short switching time. And unlike most conventional light sources, they contain no mercury. One of the main benefits of LEDs is the ability to control the spectral output of a lighting system. LEDs are already available in the entire relevant spectral range from near infrared (IR) to near ultraviolet (UV). They can be customized for specific crops and optimized for maximum production to avoid wasting energy and non-productive wavelengths.



WHY HORTILED

- More than 8 years of R&D experience in LED lighting for plants
- Close work with scientists in the fields of physics and plant photophysiology
- Successful transfer of R&D experience to industry
- Numerous scientific experiments at industrial greenhouses
- Applications for research and industry
- High-quality engineering and components
- Qualified technical support