



FLUENCE

BY **OSRAM**

# EXPLORING THE INTERACTION BETWEEN LIFE AND LIGHT

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LED GROW LIGHTS DESIGNED FOR  
COMMERCIAL HORTICULTURE

# EXPLORING THE INTERACTION BETWEEN LIFE AND LIGHT

The duality nature of light is responsible for the growth and development of all plants. Its energy drives the most important chemical reaction on Earth, and its wavelengths are the force behind the plant structure, flavor, biomass, reproduction, color, and nearly endless phytonutrients.

Our ability to harness and control light with advancements in LED technology is driving a new wave of research in photobiology, and creating new opportunities in the commercial agriculture industry to increase growth, sustainability and customer satisfaction. Fluence is committed to ensuring our clients are at the forefront of this new era.



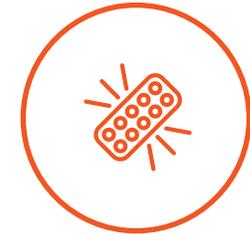
OUR SUCCESS IS TIED TO YOURS



OUR INNOVATION STARTS WITH YOUR BUSINESS



EVIDENCE-BASED DESIGN



PURPOSE-BUILT SOLUTIONS

## OUR SUCCESS IS TIED TO YOURS

We strive to improve the financial performance of our clients by understanding the ins-and-outs of their business to develop solutions targeting three financial drivers.

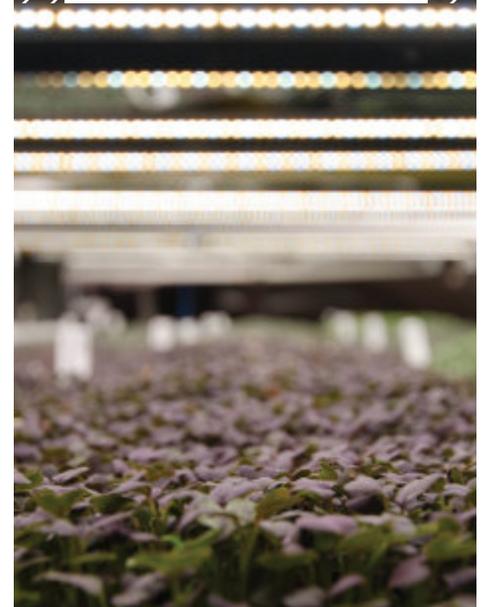
INCREASED REVENUE



REDUCED OPERATING COST



CONSISTENT QUALITY 365





## OUR INNOVATION STARTS WITH YOUR BUSINESS

Our customer support strategy is quite simple: ensure our clients are successful. That is why we don't make transactions, we make partnerships to ensure your success from cultivation to revenue. When you invest in Fluence, we invest in you.



EDUCATE

From your first call with a Fluence Horticulture System Specialist to your final harvest of the year, we're with you every step of the way. Our specialists are trained in all aspects of controlled environment agriculture – from integrated pest management and plant-process flow to measuring and adjusting your electrical conductivity –to empower clients with the knowledge to stay ahead.



EMPOWER

We take pride in working with our clients to help them realize their full potential under Fluence solutions. That's why we offer services at no cost. From lighting designs and cultivation support to key metrics to success and analytics, we assist our clients in saving money while producing high-quality products.



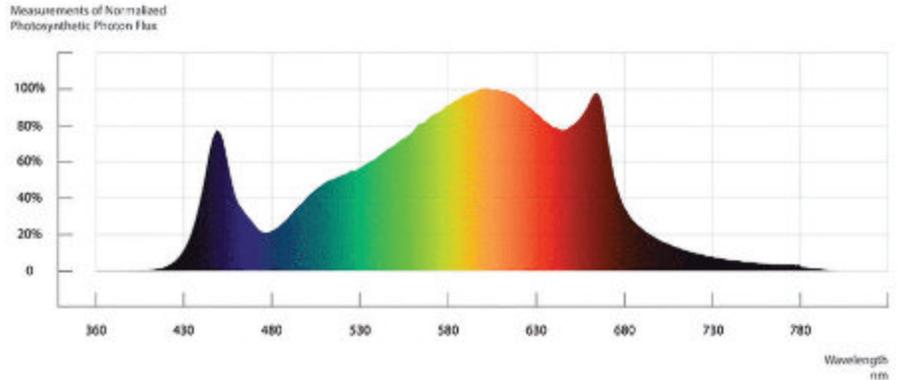
CONNECT

Our increasing network of growers, system engineers, professional services, commercial agriculture providers and researchers provide the knowledge and resources to help grow your business no matter what stage you are in.

# EVIDENCE-BASED DESIGN

## PhysioSpec Indoor™

A full-cycle broad spectrum optimized for rapid growth and complete plant development. Tailored for growing plants from initiation to senescence (germination, clones/cuttings, mothers, vegetative and flowering applications) in indoor environments.

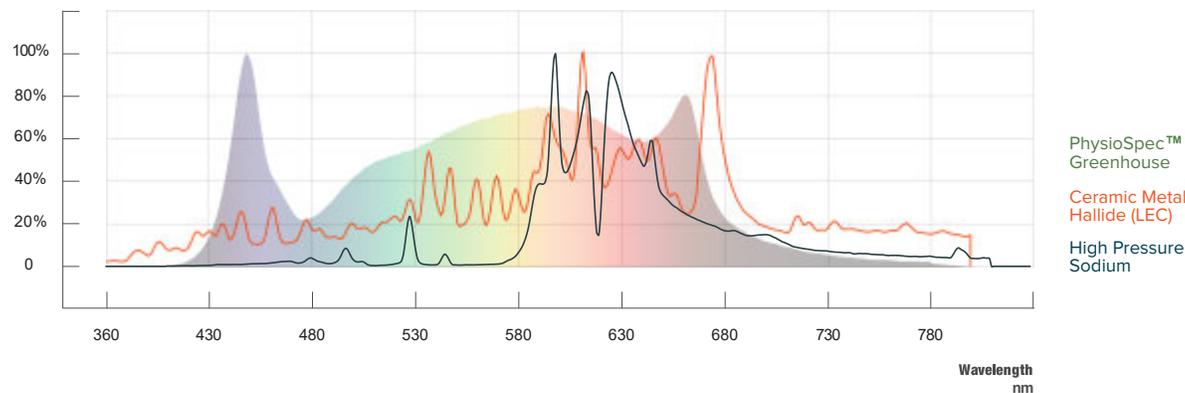


## Spectral Power Distribution Chart: See the Difference

Our wavelengths are tailored for particular photomorphogenic responses, photoperiodic signals, chlorophyll A and B absorption, xanthophyll carotenoid pigments, and anthocyanin accumulation in plant tissue, along with unknown photoreceptors, to name a few. PhysioSpec Greenhouse™ is an

enriched spectrum with a higher amount of blue photons in the 400-500nm range, which are used to affect plant stretch induced by the far red radiation. See how PhysioSpec Greenhouse™ compares to legacy technology Ceramic Metal Halide and High Pressure Sodium below.

Measurements of Normalized Photosynthetic Photon Flux



## FLUENCE RESEARCH

The commercial agriculture industry is undergoing seismic change due to advancements in photobiology research made possible by compound semiconductors. Fluence scientists study light-mediated plant responses by examining how light quality and intensity impact overall plant physiology, including chemical composition of secondary metabolites.

Our research team also partners with industry leaders for a greater understanding of photobiology and plant growth and development that spans all sectors of horticulture. Additionally, through partnerships with academic researchers, our technology enables discovery in other areas of horticulture at large.

## PURPOSE-BUILT SOLUTIONS

### As Powerful as it is Precise

The SPYDR Series is purposefully designed for high intensity vertical farming with PPFD up to 1,060  $\mu\text{mol}/\text{m}^2/\text{s}$  over a 4'x4'. We designed and built SPYDR just 1.3" thin with specialized optics for close-proximity cultivation because the last thing a vertical farm light should do is get in the way of your next tier.

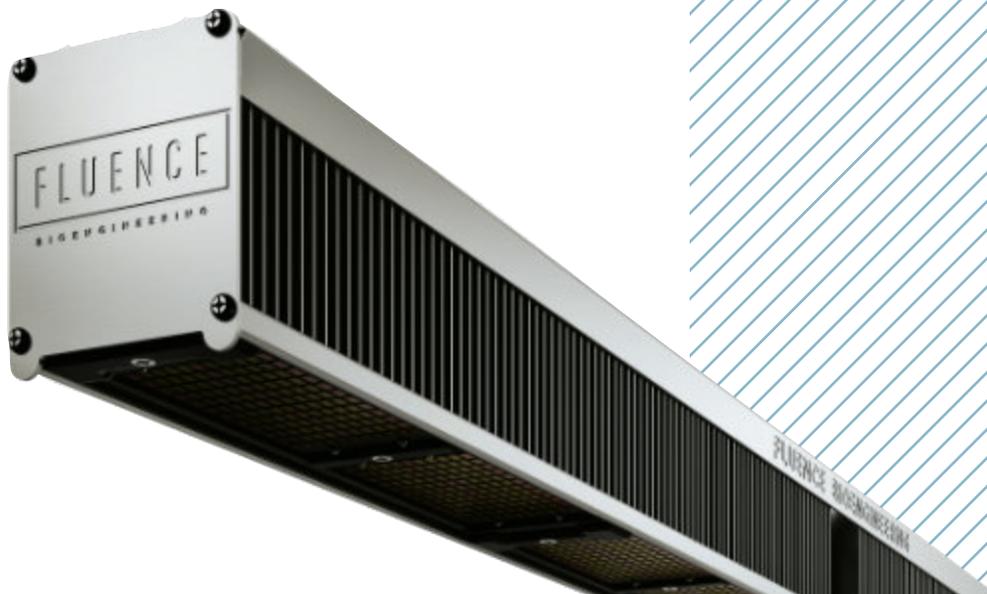


**S** SPYDR

### A Powerful and Efficient Alternative to the Status Quo

Whether extending your day or extending your season, the VYPR Series has the power, energy efficiency and longevity to grow "sunup to sundown to sunup" year round. VYPR is optimized for greenhouses and open indoor areas delivering high, and uniform, levels of PPFD. We designed and built VYPR to a mere 2.9" wide because the last thing a greenhouse light should do is block the sun.

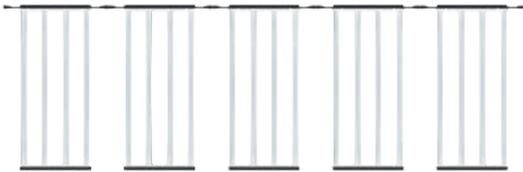
**V** VYPR



## A Fresh Start to a Perfect Harvest

Designed for the world's largest vertical farms, the RAZR Series tackles a wide range of vertical farming applications with average PPFd ranging from 125-375  $\mu\text{mol}/\text{m}^2/\text{s}$ , making the RAZR Series ideally suited for full-cycle cultivation of leafy greens, microgreens, and culinary herbs as well as propagation of vegetable, ornamental crops and cannabis.

**R** RAZR



**RAZR2, RAZR3 and RAZR4** come in set arrays with a stand-alone power enclosure that can be mounted on a wall away from the grow environment, or on a cart for maximum mobility.



## RAZR<sub>x</sub>

With cantilevered mounting, and a modular width, RAZRx is designed for efficient plant-process-flow utilizing Danish trolleys and similar 53" long mobile racks. Delivering an average of 295  $\mu\text{mol}/\text{m}^2/\text{s}$  over a 2'4" area, RAZRx is ideal for full-cycle produce, ornamental and floral cultivation.



## PAVING THE WAY FOR THE FUTURE

Many unanswered questions remain in the area of photobiology, the rapidly emerging vertical farm and cannabis industries, and the always evolving food and ornamental floriculture industries. Cannabinoid and terpenoid science is in its infancy; advanced controls will continue to evolve to allow us to better control OpEx and transform the HVAC and dehumidification challenges we face in gardens; and the commercial agriculture industry will become better stewards for our patients, consumers and the environment, as we collectively embrace more ecologically friendly, consistent and optimized cultivation practices.

We look forward to sharing this journey of exploration with you.

FLUENCE

BY OSRAM

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& BUILT  
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