



# LED HORTICULTURAL LIGHTING PERFORMANCE TESTING AND CERTIFICATION

EXPECT MORE FROM CSA GROUP

## MEASURE PAR, FLUX, EFFICACY, IRRADIANCE, POWER UNIFORMITY

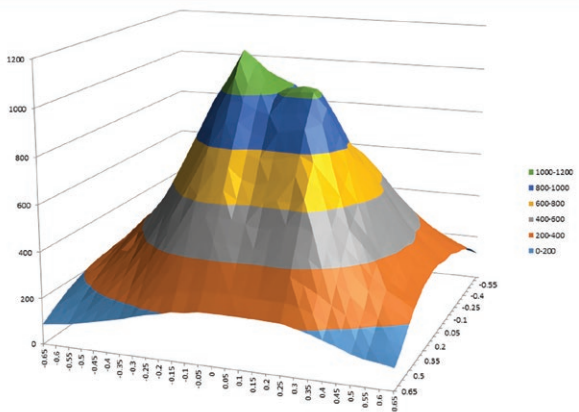
GET A COMPLETE PICTURE OF THE EFFICIENCY AND EFFECTIVENESS OF YOUR LED LAMP DESIGN

For more than six years, CSA Group has been involved in the design, prototyping, and testing of LED-based horticultural lighting. Whether it is designing a lighting product from concept, refining a prototype design, or testing and measuring the photon flux of a finished product, we have the experience to help.

- Planar irradiance method tests all relevant light specifications
- Easy to read reporting shows:
  - » Photosynthetically Active Radiation (PAR)
  - » Plant Biologically-Active Radiation (PBR)
  - » Yield Photon Flux (YPF)
  - » PBR Efficacy
  - » YPF Efficacy
  - » Photon Flux Distribution
  - » Color uniformity (centroid wavelength distribution)
- Understand the energy consumption of your product

Innovations in LED lighting technology are changing the face of the horticultural lighting industry. As growers seek more energy-efficient solutions to their greenhouse needs, new LED-based designs are becoming more common. With LED lighting, growers can fine-tune their environment to meet the specific needs of their plants throughout the grow cycle.





## SpectralSuite 3 LED Metrology Software

Our SpectralSuite 3 LED metrology software supports horticulturally relevant metrics and can be used to accurately determine the PAR, PBR, and YPF present in an existing lighting design. Contact us today to discuss how we can help create, refine or verify your lighting concepts.

## Performance Testing

High humidity, high temperature, water spray, and airborne contaminants, like fertilizers, can all effect the performance of horticultural lights. CSA Group can help ensure your horticultural lights will withstand the demanding greenhouse and indoor farming environments seen in today's agriculture.

There are a variety of standards which can evaluate the performance of lighting products used in horticultural environments.

### For humid and wet environments:

- ICE 600598-1, IP65 or similar
- ANSI/UL 1598, Clause 13.4.8, Clause 18.1 (can be used to test dielectric voltage breakdown as well)

### For the eye safety of your fixture:

- ANSI/IESNA RP-27, (recommended practice for the photobiological safety for lamps)
- IEC 62471 (CIE S009)
- IEC 60825-1

In addition to elevated ambient temperatures, greenhouses may also be corrosive environments as well. Attentional testing may be required for these environments:

- ANSI/UL 1598A Clause 4.1.d or 4.2.b
- ANSI/UL 1598 Clause 12.4.2 (for temperatures above 25°C)

## Contact Us

Put CSA Group's industry-leading knowledge and experience to work for you.

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