



MEETING NOTICE & INVITATION  
Pacific Northwest Chapter • Society for Information Display

***Canadian Standards Association (CSA) PNW Lighting Division  
new Seattle facilities overview and lab tours.***

**Peggy Lopez**

Sr. Optical Test Engineer/Technical Writer, CSA Seattle Group – PNW Lighting Division

**Wednesday, January 20th at 6:00 P.M.**

CSA Seattle Group  
14833 NE 87TH ST  
Redmond, WA 98052-3485  
Office: 425-605-8500 x221  
Peggy's Cell: 425-770-9659

**Abstract**

CSA is a standards orientated company (similar to UL) which operates all over the world. They test everything from toilet seats to Nuclear Power Plants. Orb Optronix was purchased by CSA in 2012 and has recently invested in a brand new custom facility in Redmond, WA. Peggy Lopez will be giving an overview of the company and what they do at the Seattle facility followed by tours of the labs.

**Speaker Biography**



Peggy Lopez is a Sr. Optical Test Engineer for CSA Seattle Group. She has over 20 years' experience testing displays and other optical components. Her areas of interest are metrology test equipment, display qualification, LED test and development, technical writing, and automated test development. She has worked at CSA/Orb Optronix for the past 6 years and was a sub-contractor at Microsoft Surface group.

Prior to working at CSA she worked as a FTE at Microsoft on the Surface Table project and at Microvision for 8 years where she helped develop the military HMD's. She is also an author/editor for the IDMS standards published through SID. She has an AS in Electrical Engineering Technician, as well as a BS and MS in Physics with emphasis on optics.

# **CSA Seattle (Orb Optronix) Lighting, Optical, and Illumination Design and Test Capabilities**

Peggy Lopez

Senior Optical Test Engineer



**CSA  
Group**

- Established 1919 in Canada
- Competitor to TÜV SÜD and UL
- Independent,  
not-for-profit organization
- Leader in standards development,  
product testing and certification,  
consumer product testing



# A Trusted Advisor



- 95 years existence
- Global outreach : 37 offices in 14 countries
- Revenue: CAD 260m (FY 2012-13)
- 1,800 employees equally spread worldwide
- 8,000 engaged and committed members
- 1,300 standards technical committees
- 3,000 + standards in 54 technologies
- 88,000 customers globally use CSA products and services

CSA marks appear on billions of products worldwide



# Global Business Units

## Consumer Product Evaluation



## Hazardous Locations & Industrial Products



## Plumbing & Construction



## Medical, Safety & Technology

## Alternative Energy & Sustainability

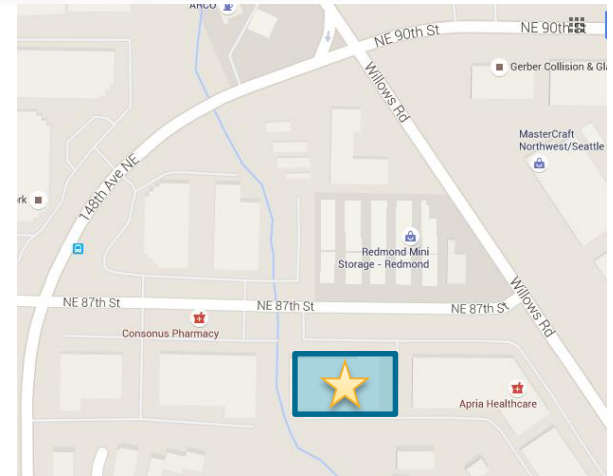


## Appliances & Gas



## Automotive/Transportation

- **Founded in 2006 and acquired by CSA in 2012**
- **18,000 sqft Laboratory in Redmond WA**
- **20 Employees**
- **New Optical Technology Prototype Facility**
- **Core Competencies**
  - **Deep technical knowledge of LED-based devices**
  - **Optical product design**
  - **Optical test methods**
- **ISO 17025 and NVLAP Accreditation for Lab Practices**
- **Complete photonics and lighting test lab**
- **First Third-party Accredited LM-80 Test Lab in the US**



# CSA Group Seattle Open House



Pictured Left to Right – Rich Weiser- Vice President U.S. and Mexico Division, Ash Sahi – President and CEO Toronto, and David Bajorins – Director of Operations Seattle.



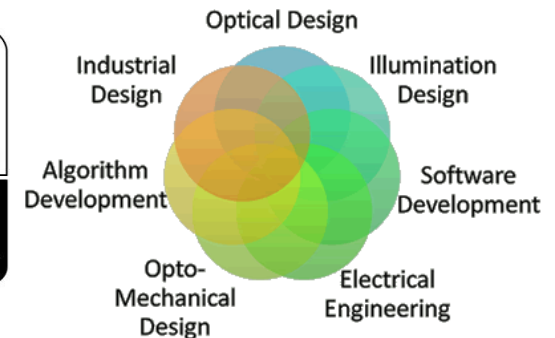
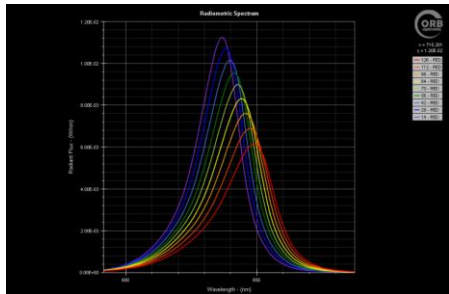


Measurement Services

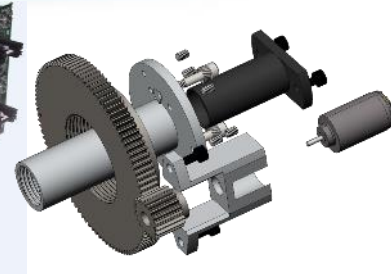
Metrology Products

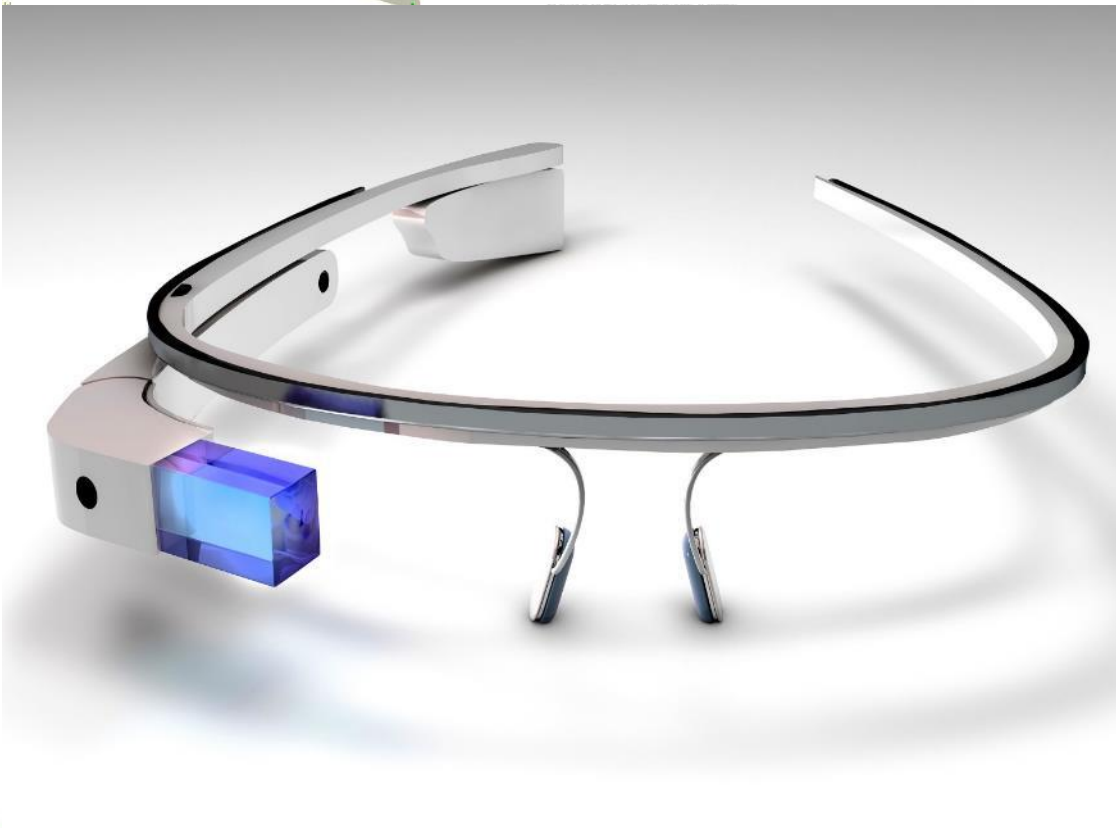
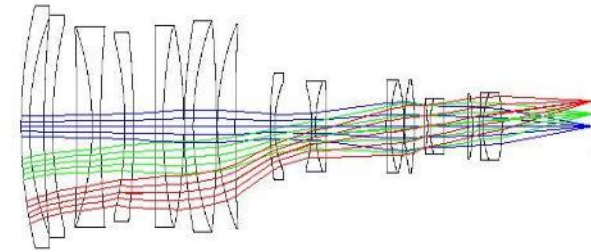
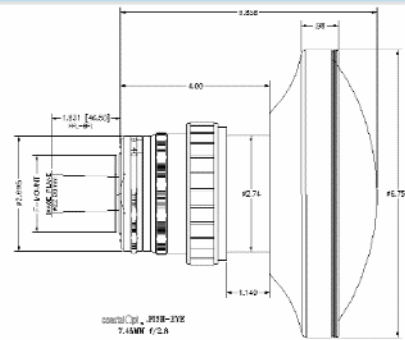
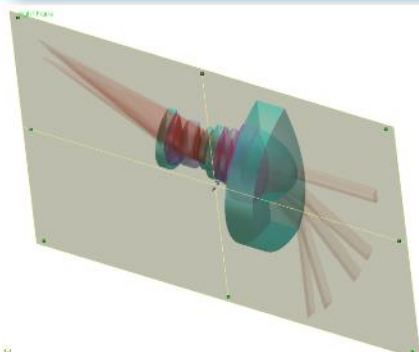
Functional Safety and Inspection

Engineering Services



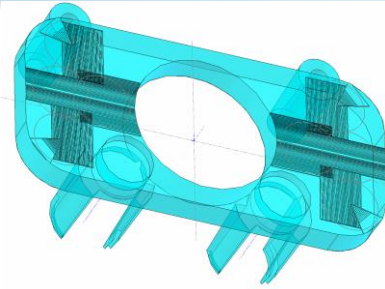
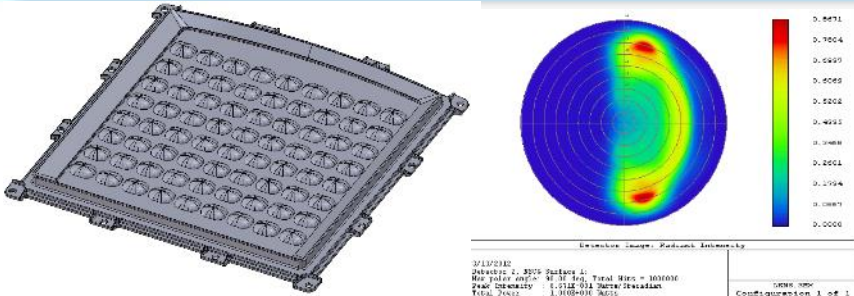
# Engineering Services Group





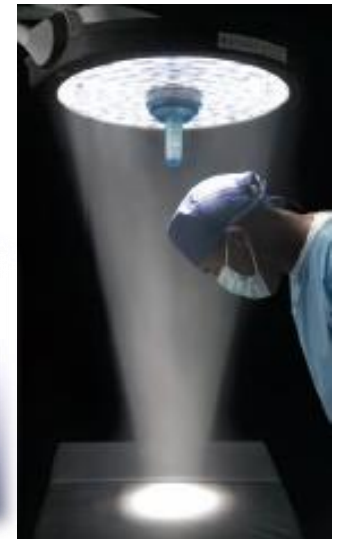
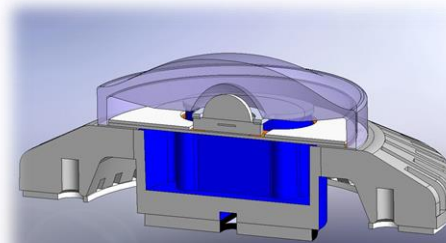
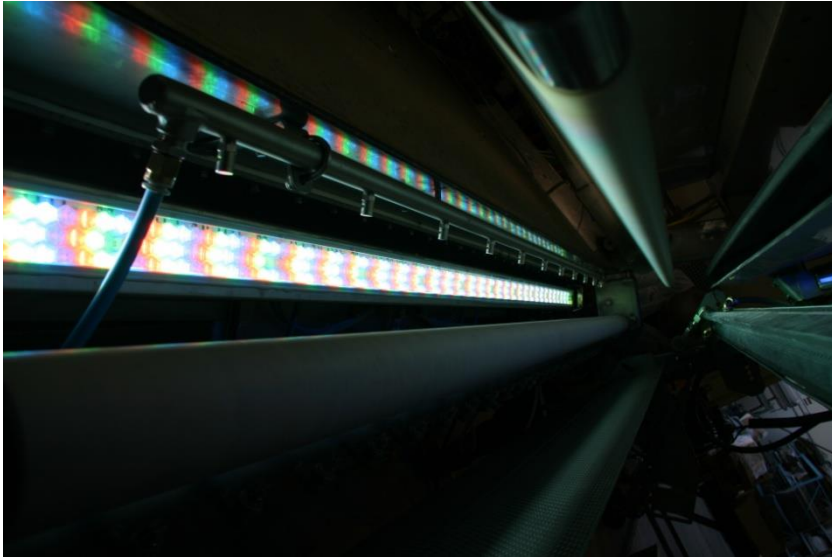
- **Lens Design**
  - Custom Lenses (UV through Far IR)
  - Micro CCD and CMOS Camera Optics
  - Projection Lenses (LCoS, DLP, LCD)
  - Scan Lenses (F-theta)
  - Telecentric Lenses
  - Plastic/Lightweight Optics
  - LED Optics
- **Scientific and Medical Instruments**
  - Telescopes
  - Endoscopes
  - Microscopes
  - SPR Spectroscopy
- **Displays**
  - Head Mounted Displays
  - Projection Systems
  - Micro-Optic Films
- **Machine Vision Systems**
  - Line Scan and Full Frame Systems
  - Laser Scanners
- **Laser Communication Systems**
  - Free Space
  - Coaxial, Binocular, and Gendered

# Illumination Design



- LED Luminaires
- LED Backlights (RGB and W)
- LED Light Engines
- LED Light Pipes
- Medical Lighting
- Street Lights
- Machine Vision Illumination
- Entertainment Lighting
- Aviation Lighting
- Backlight Unit
- Projection Systems
- Micro-Optic Films
- Light Guides
- Frustrated TIR and Surface Computing
- Mobile Devices

# Illumination Design



# Photorealistic Rendering



Laboratory Measurement



Model Correlation



Renderings



- IR illumination design
- Camera design
- Time of flight gesture recognition



# Orb System Tests for L-Prize Winner



## Automated Lifetime Test systems

Orb build the hardware and software used by the DOE to select the worlds best 60W LED replacement bulb.

This robot tests 200 light bulbs every day, and has been running for over 40,000 hours with no downtime as of July 2015.

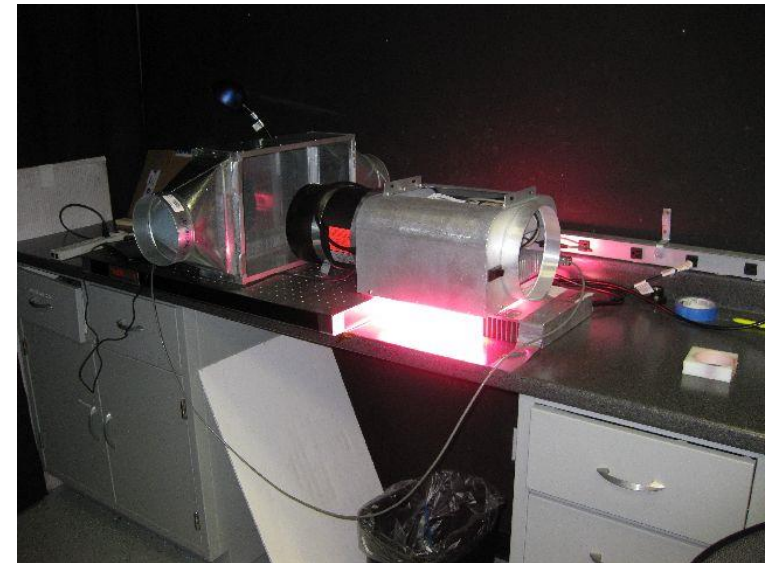


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# Horticulture Lights

- 1000W
- PAR at 12in 2050  $\mu\text{mol}/\text{m}^2\text{-s}$
- 6 individually controlled PWM color Ch.
- Forced air cooling
- Ethernet control
- Tablet interface with control GUI



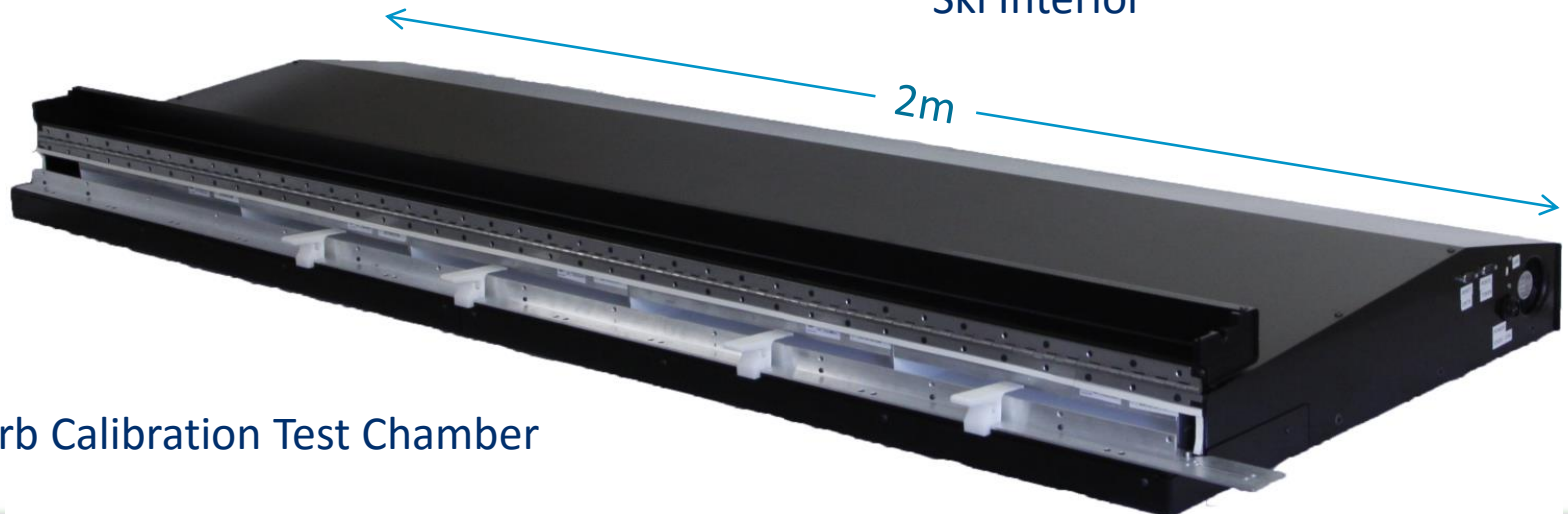
# Boeing Ski Interior (on new 737s)

## LED Lighting Production Calibration Chamber

- Each light bar is calibrated at 45 different color points
- Color mixing calibration has both thermal and lumen maintenance control algorithms for constant color over temperature and lifetime.
- In full production



Ski Interior



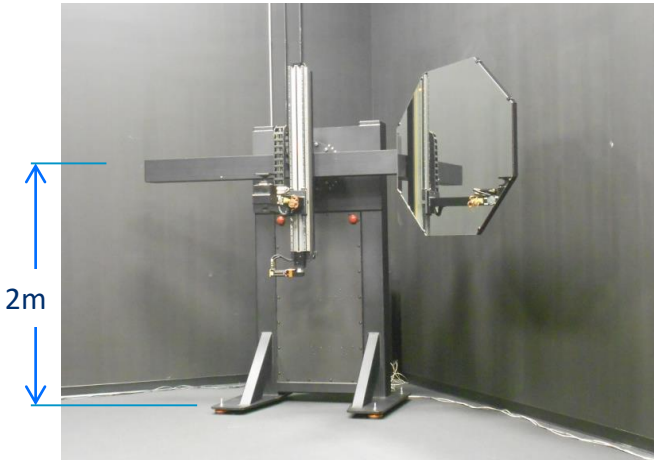
Orb Calibration Test Chamber

# LED Test & Measurement Services



- ISO 17025 Accredited Testing Laboratory
- NVLAP Accredited for LM-79 and LM-80
- EPA Recognized, ENERGY STAR® independent third party, LM-80 Lumen Maintenance Testing and LM-79 Lamp and Luminaire Testing
- LED Lighting Facts® Approved, DOE CALiPER Testing Lab
- ETΦ™ LED Characterization Service (*Electrical-Thermal-Optical*)
- Flat Panel Display Testing – Medical, Aerospace, Automotive
- High-Irradiance Stress Testing – Optics and Phosphors
- Eye Safety - Evaluation to ANSI/IESNA RP-27, Recommended Practice for Photobiological Safety for Lamps /Evaluation to IEC 62471 (CIE S009)

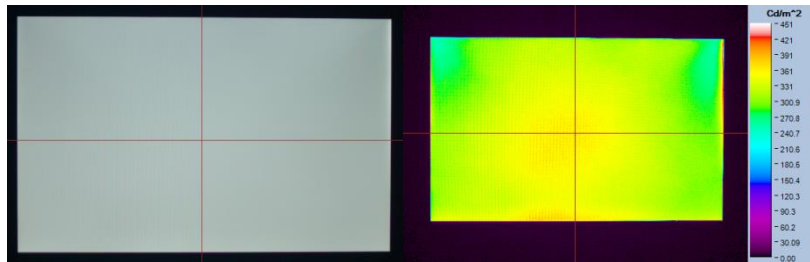
3m Integrating Sphere



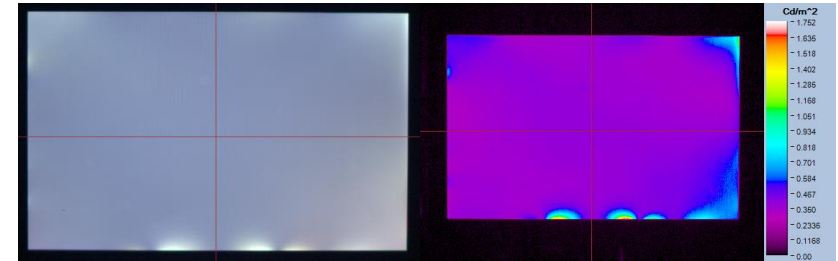
# Advanced Display Testing

The medical, automotive, and avionic industries require more advanced testing including functionality in typical ambient lighting conditions. Examples of some of the advanced tests are show below.

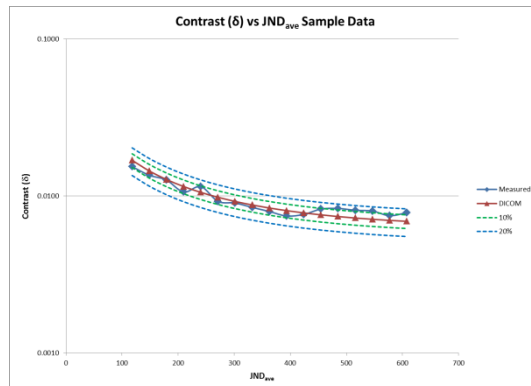
## Uniformity and False Color Plots



## Mura Analysis



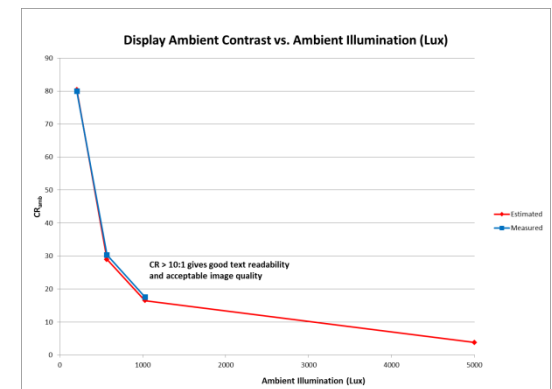
## DICOM Calibration and Comparison



## Diffuse and Specular Reflectance



## Ambient Contrast



# LM-80 Systems and Testing Services



**Built-in Software Monitoring, Configuration and Load Tuning**

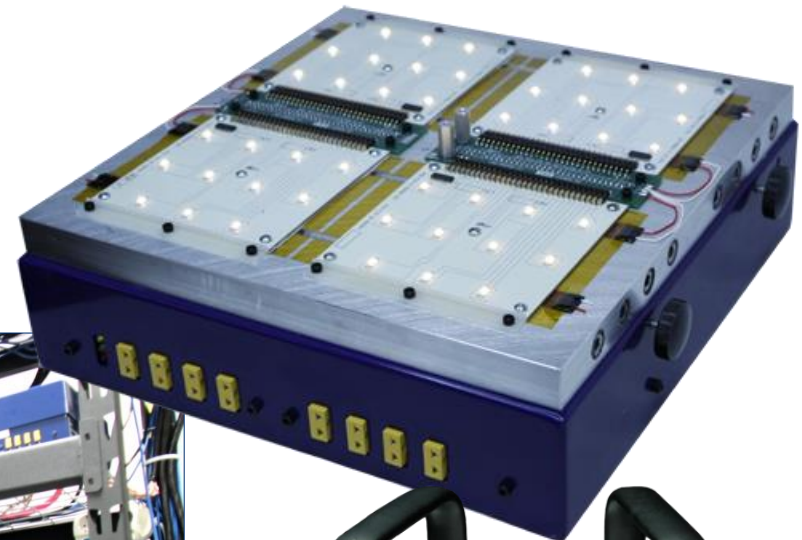
**Scalability**

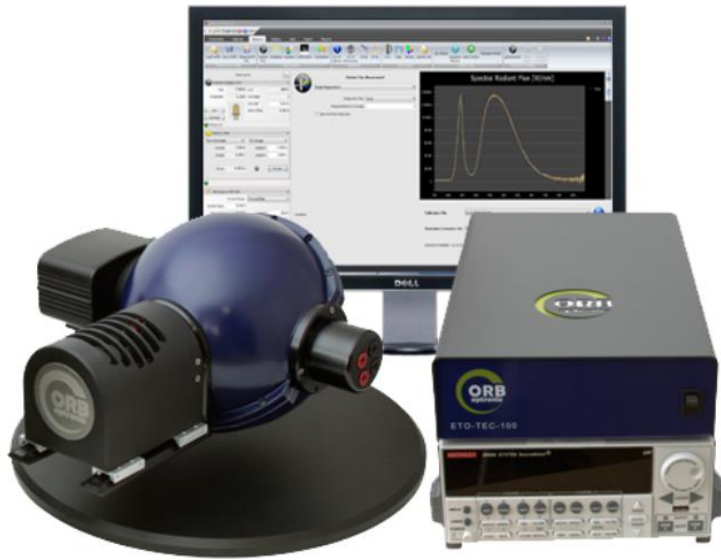
**Energy Efficient by Design**

**Series Drive Capabilities**

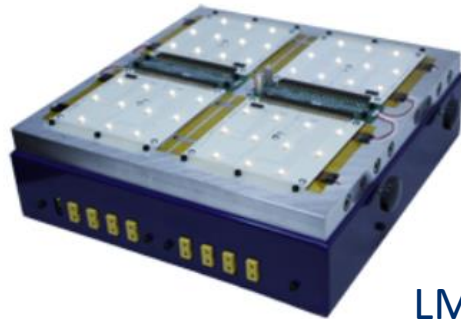
**Easy to use Control Software**

**Temperature Monitoring In-Situ**





ETΦ™ LED Characterization System



LM-80 Test Equipment

SP-100 Multifunctional Spectroradiometer

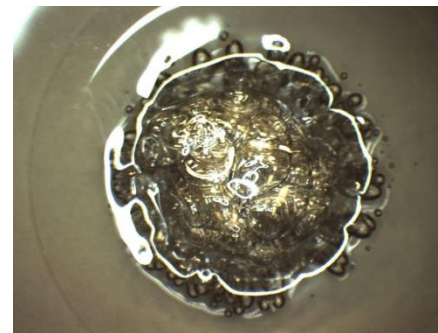
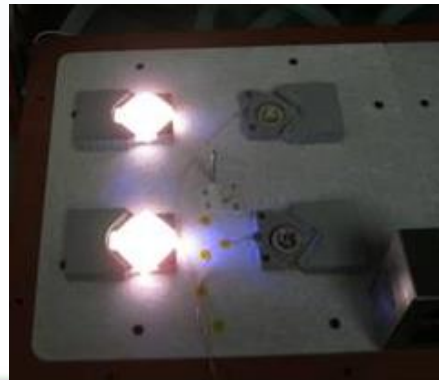


ETIC

# Elevated Temperature Irradiance Chamber



- Accelerated Testing of Optical Materials
  - LED lens plastics
  - Automotive materials
  - Remote Phosphors
  - Silicone
  - Reflectors
- Quantitative Interrogation
- Calibrated Irradiance levels
- UV, Blue and other wavelengths
  - 380nm to 670nm including white
- Software control and data logging
- Irradiance levels up to 150X of the Sun
- Temperature up to 150°C



# Thank You

