

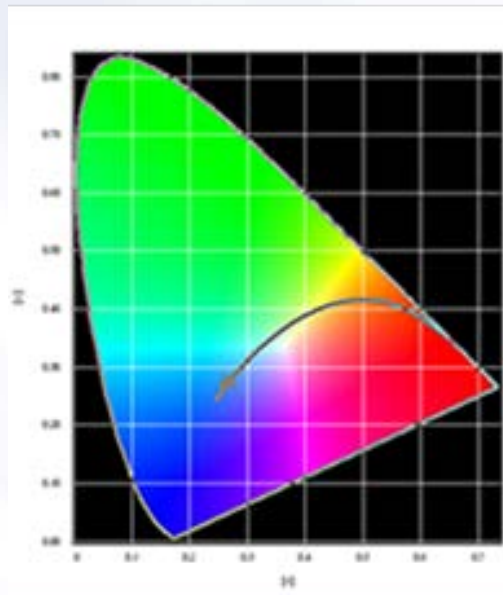
## LED test services

LEDs are being used more and more in industrial and automotive applications. MASER Engineering can perform a full spectrum of tests to measure the LED performance. LED parameter characterisation, construction analysis, reliability and failure analysis are performed for UV, visible and IR LEDs



### LED TEST SYSTEMS:

- Instrument Systems MAS40 Mini-Array Spectrometer (390 – 950 nm)
- Ocean Optics USB4000 Spectrometer (200 – 1100 nm)
- Integrating sphere for spectral output measurement
- Wavelength:
  - Ultraviolet : 230 - 380nm
  - Visible : 380 - 700nm
  - Infrared : 700 - 1100nm (1650nm)



### LED PARAMETERS:

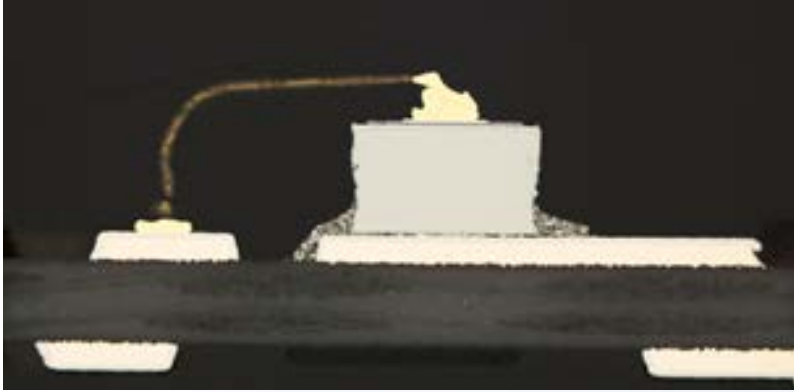
- Peak Wavelength (nm)
- Spectrum Half Width (nm)
- Luminous Flux (Lm)
- Optical Power, Radiant Power, Radiant flux (W)
- Luminous Intensity (cd)
- Radiant Intensity (W/Sr)
- Power Supply (DC & pulsed)



### LED RELIABILITY TEST STRATEGY:

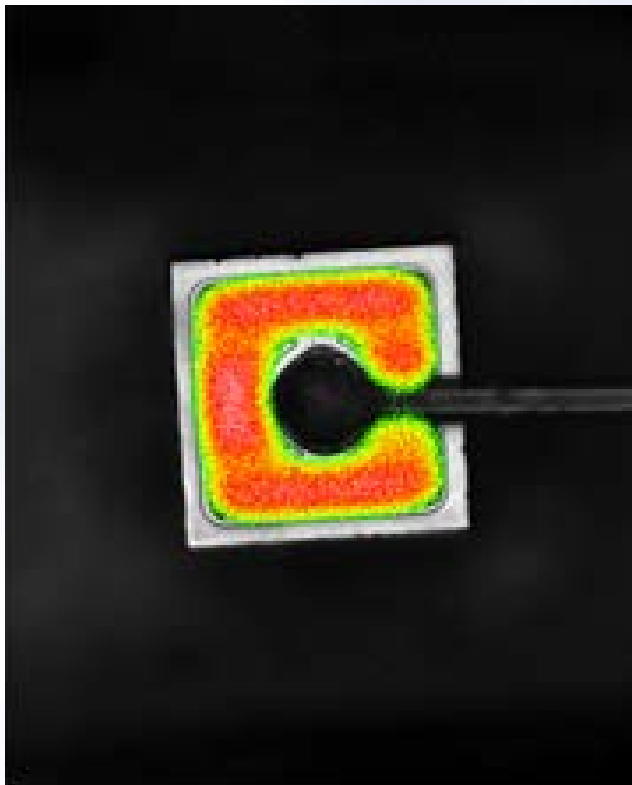
- Lumen maintenance
- Optical characterization
- Thermal management
- Environmental Test
- Mechanical robustness / vibration
- ESD
- Failure Analysis
- Standards / Standardisation

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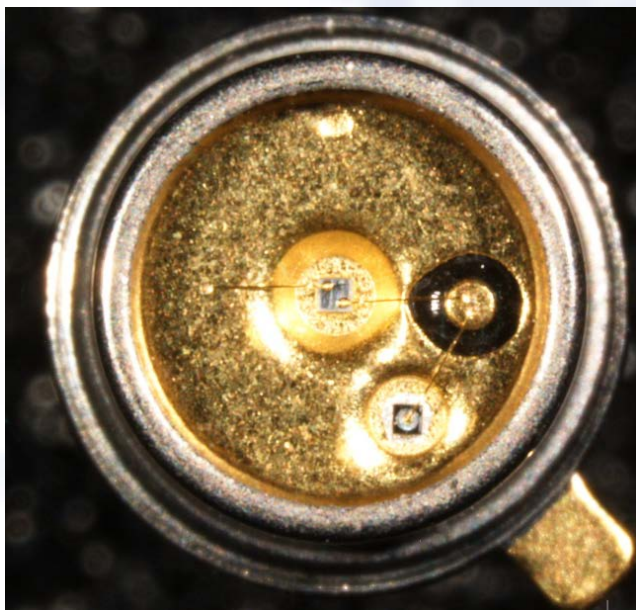
### CONSTRUCTION ANALYSIS:

- Optical inspection
- Cross-sectioning
- Delamination analysis
- Wirebond quality
- Die attach quality
- Material analysis



### FAILURE ANALYSIS:

- Electrical /optical verification
- Silicon lens removal by Microwave Induced Plasma
- Optical/SEM inspection
- EMMI/OBIRCH analysis
- Lock-In Thermography analysis
- Hot spot and static temperature measurements
- FIB cross-sectioning



### LED SYSTEM TEST:

- LED system analysis
- From LED to application
- Overall construction assessment
- Reliability test plan
- Failure analysis

For more info please visit [www.maser.nl](http://www.maser.nl)  
For inquiries please contact : [info@maser.nl](mailto:info@maser.nl) or call +31 53 480 26 80