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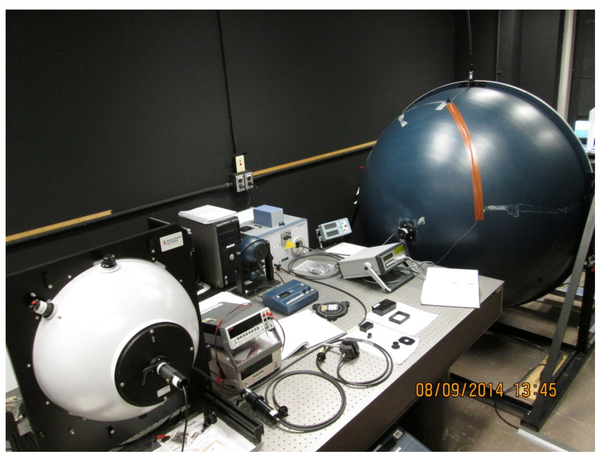
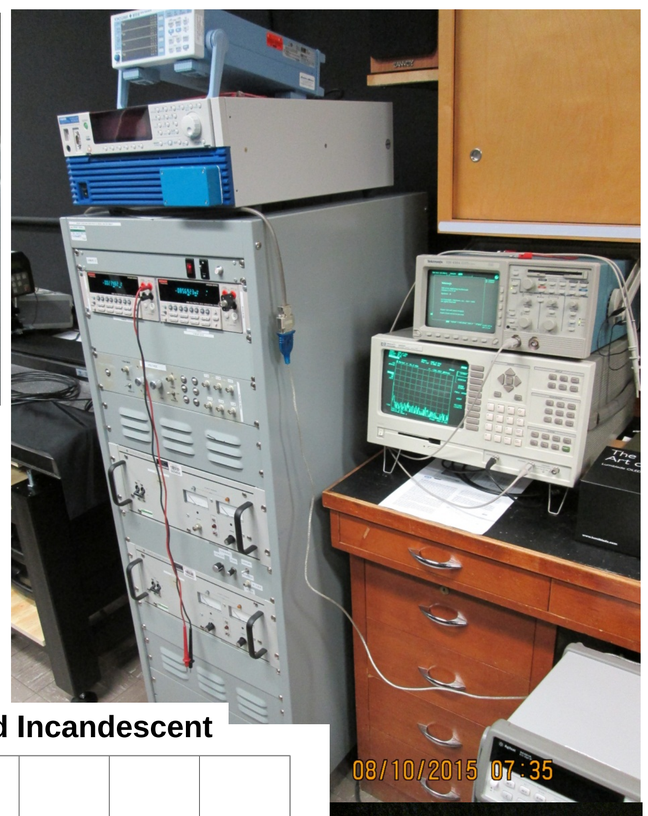
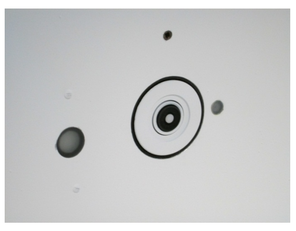
NRC·CNRC

Measurement Science and Standards

NRC Solid State Lighting lab and OLED measurements







ABSTRACT

The NRC Measurement Science and Standards (MSS) portfolio is developing measurement facilities to provide accurate, SI-traceable, photometric and radiometric measurements of solid state lighting (SSL) devices, in response to the increased scientific and commercial requirements for accurate SSL component measurement. This includes the measurement of both calibration standards and modules used in commercial lighting products. These facilities include 1.6 m and 0.50 m diameter integrating spheres and linear optical tables with a diode-array spectroradiometer and a fibre-coupled scanning spectroradiometer (200 nm to 1700 nm) for total luminous flux, total spectral flux, radiance/luminance, intensity/irradiance and correlated colour temperature measurements. Mechanical set-ups are available to provide both goniometric and surface positional measurements of the radiation from SSL devices.

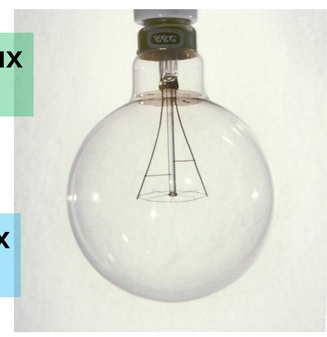
Measurements are traceable to the SI through the NRC basic standards of luminous intensity, luminous flux and spectral irradiance. Measurement procedures have been successfully tested through NRC participation in the IEA 4E SSL Interlaboratory comparison of LED products.

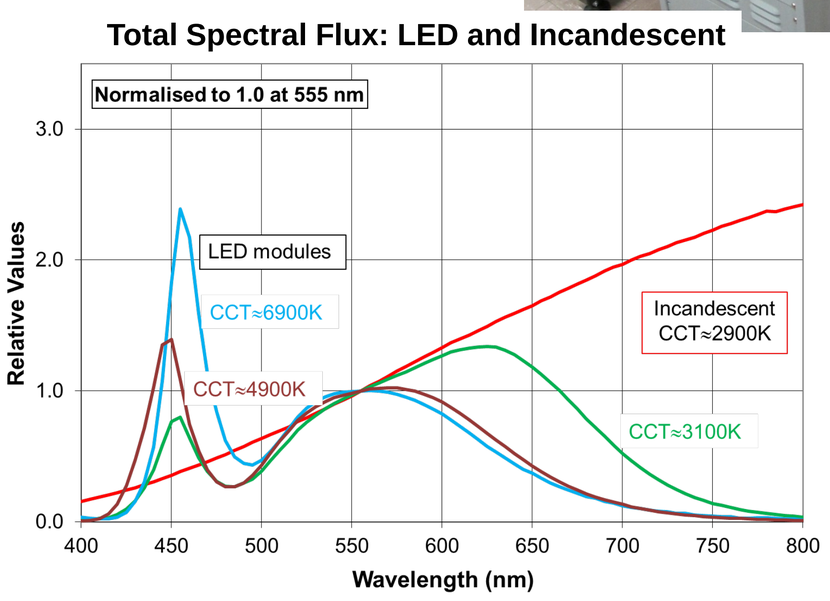
We present some recent goniometric and position dependent measurements of OLED samples.

Spectral Irradiance Standard

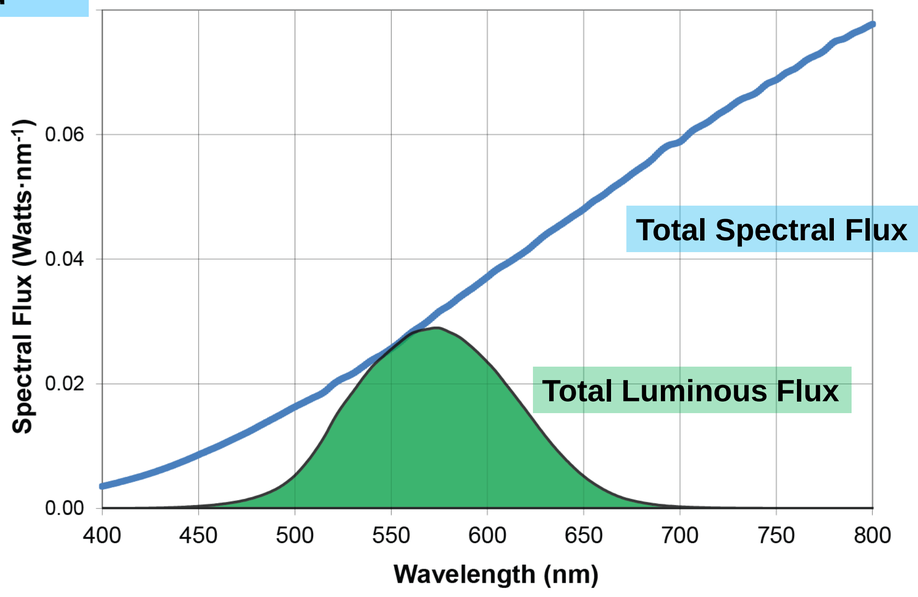
Total Luminous Flux Standard (TLF)

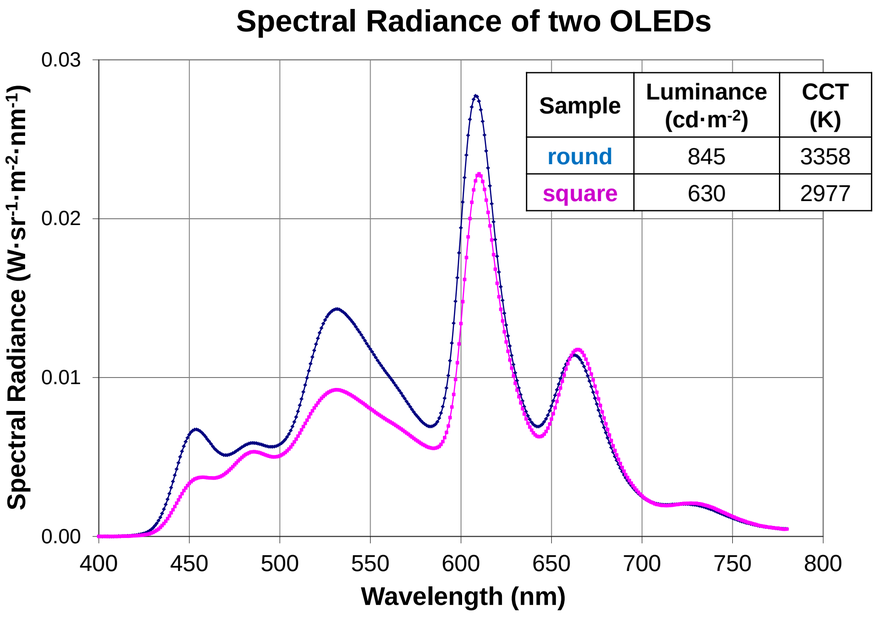
Total Spectral Flux Standard (TSF)

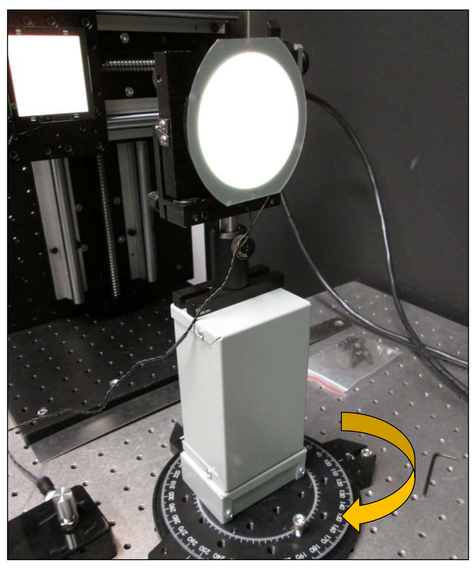


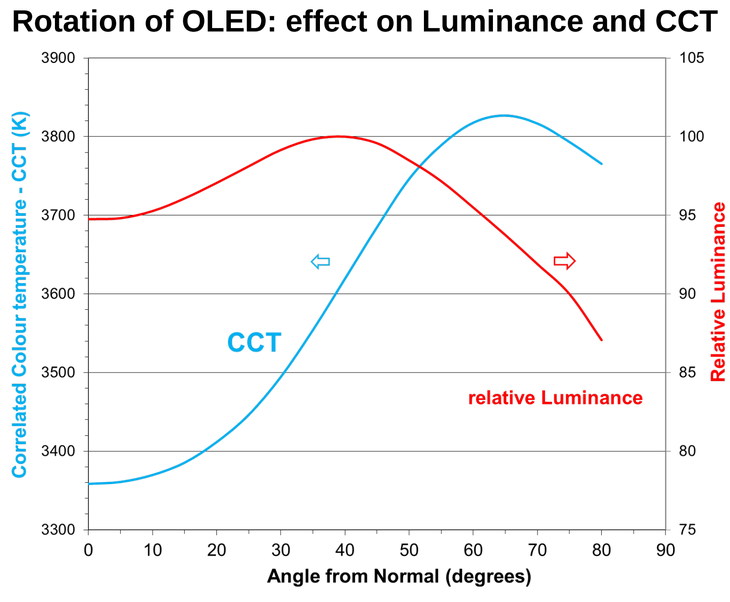


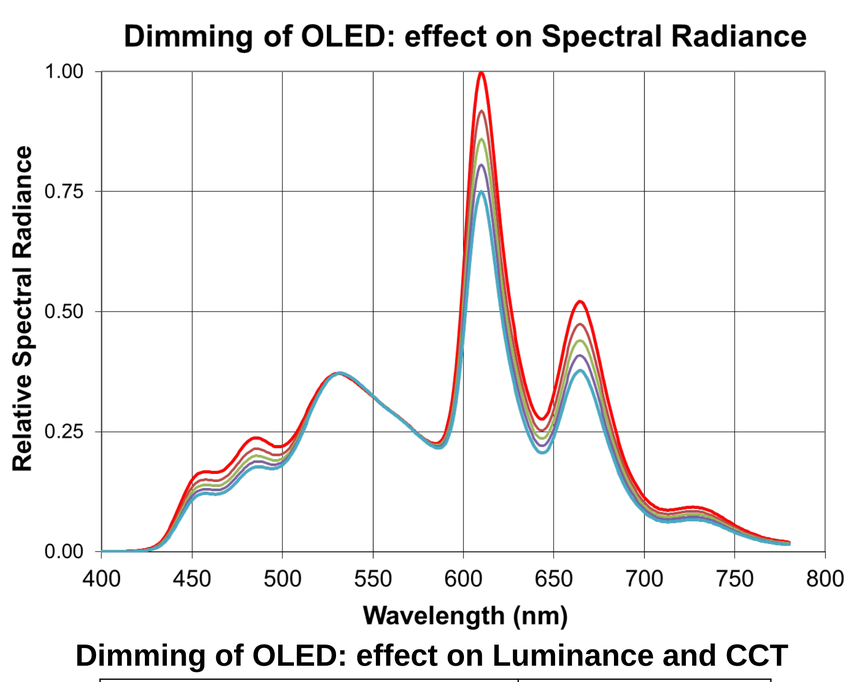
LED (CCT ≈ 4900K)

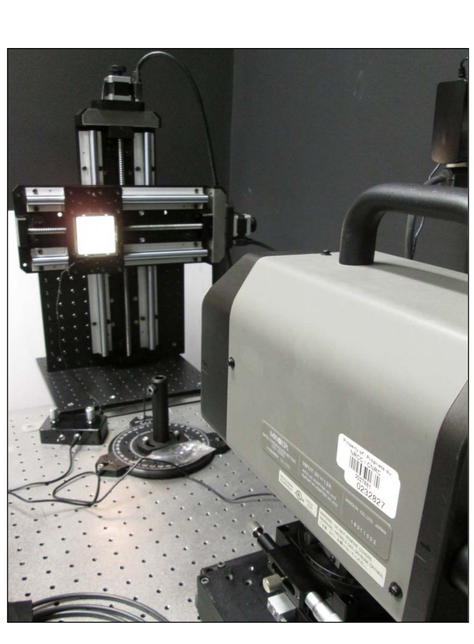


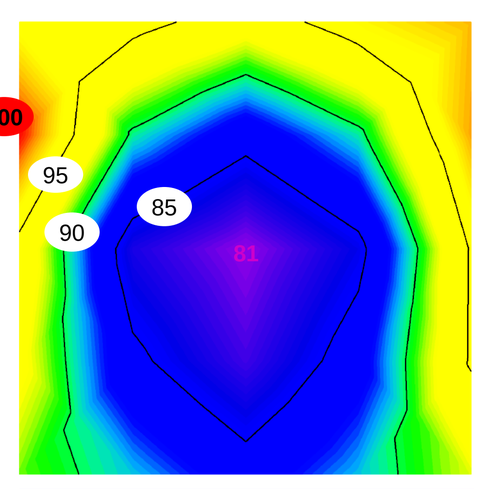




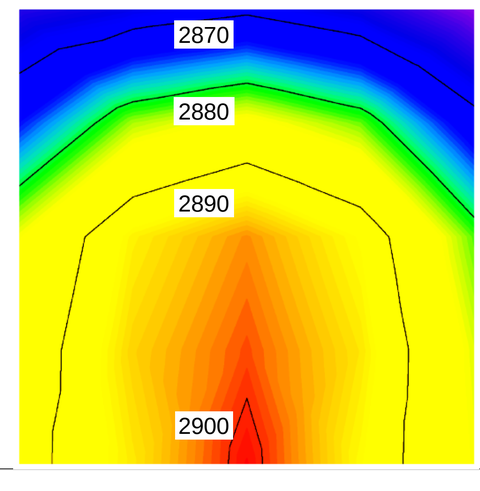








Surface Scan relative Luminance



Surface Scan CCT (K)

Dimming of OLED: effect on Luminance and CCT

Relative Luminance	CCT (K)
100	2870
35	2977
15	3064
7	3156
3	3261