

**CIE 127, updated in 2007, is published as a technical report to provide industry with guidance on the correct measurement of the optical radiation emitted from LED devices, which, due to their nature and use, can lead to erroneous measurements.**

The Bentham CIE 127 equipment ensemble permits the accurate determination of all pertinent optical parameters: average intensity, angular distribution, total spectral radiant/luminous flux and colorimetric parameters.

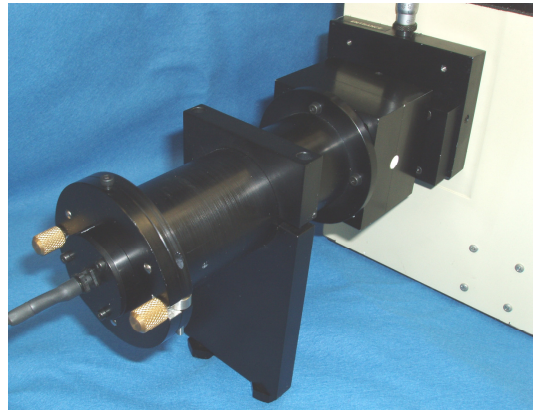
## Average Intensity

The true measurement of LED intensity- the most often cited datasheet parameter- should be performed at a distance at which the source may be considered a point source, which condition is often not adhered to, leading to the reporting of erroneous LED performance data.

To circumvent such problems, CIE 127 has introduced two standard near-field measurement conditions, A and B.

The LED in such a case is positioned at a precise distance (condition A- 316mm, condition B-100mm) from a detector of a 100mm<sup>2</sup> area.

These conditions correspond to the measurement of the LED over a solid angle of view of 0.001sr (condition A) and 0.01sr (condition B).



The Bentham CIE127 Average Intensity optic employs an integrating sphere of 100mm diameter to substitute the aforementioned detector, and may be used as input optic to any Bentham monochromator for the measurement of spectral average intensity.

With a calibration of spectral irradiance (with any Bentham irradiance standard; CL6, CL2), the intensity can be found from the product of the measured irradiance by the measured condition distance squared.



# CIE 127 LED Characterisation

Average Intensity / Angular distribution / Total luminous flux / Colorimetry

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## Angular Intensity Distribution

Designed for the determination of single LED angular intensity distribution, where point source conditions apply, the LED Goniometer includes a single axis goniometer set at a distance of 750mm from a detector. Manual rotation of the LED on the goniometer permits the measurement of additional planes. The detector used may be either a cosine corrected diffuser to couple light to any Bentham monochromator to measure spectral output as a function of angle, or a photometric detector coupled to an ORM40 optical radiation meter, from which can be determined directly the LED intensity.



## Total Spectral Radiant/ Luminous Flux

The determination of total spectral radiant flux or its' photometric counterpart, luminous flux, requires the total output of the source to be measured.

This is typically performed with an integrating sphere input optic which samples all light output from the source. Depending on the size of the source to be measured, Bentham supplies integrating spheres from 200mm to 1.8m diameter, the former being typically employed for the measurement of single LEDs.

The sphere structure is such that a baffle prevents light from the LED directly reaching the output port, whilst an auxiliary/calibration lamp permits the calibration of the sphere and accounts for changes to the properties of the integrating sphere by virtue of introduction of a sample. Samples are inserted by a holder placed at the sample port.

This input optic may be coupled to the entrance port of any Bentham monochromator.

