



International Commission on Illumination  
Commission Internationale de l'Eclairage  
Internationale Beleuchtungskommission

**CIE S 025/E:2015**

## **International Standard**

# **Test Method for LED Lamps, LED Luminaires and LED Modules**

Méthode d'essai pour lampes à LED, luminaires à LED et modules à LED

Testmethode für LED-Lampen, LED-Leuchten und LED-Module

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CIE Central Bureau, Vienna  
Babenbergerstrasse 9, A-1010 Vienna, Austria

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Quantities related to photometric and  
other measurements

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CIE Central Bureau  
Babenbergerstrasse 9  
A-1010 Vienna  
Austria  
Tel.: +43 1 714 3187  
e-mail: [ciecb@cie.co.at](mailto:ciecb@cie.co.at)  
[www.cie.co.at](http://www.cie.co.at)

## **Foreword**

International Standards produced by the Commission Internationale de l'Éclairage are concise documents on aspects of light and lighting that require a unique definition. They are a primary source of internationally accepted and agreed data which can be taken, essentially unaltered, into universal standard systems.

This CIE International Standard has been prepared by Technical Committee TC 2-71 of Division 2 "Physical Measurement of Light and Radiation" of the Commission Internationale de l'Éclairage.

This standard was developed in collaboration with CEN/TC 169/WG 7, which developed EN 13032-4, to produce two technically-harmonized standards at CIE and CEN level.

The collaboration of CEN/TC 169 is acknowledged.

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## Test Method for LED Lamps, LED Luminaires and LED Modules

### Introduction

This standard provides requirements to perform reproducible photometric and colorimetric measurements on LED lamps, LED modules, and LED luminaires (LED devices). It also provides advice for the reporting of the data.

The availability of reliable and accurate photometric data for LED devices is a basic requirement for designing good lighting systems and evaluating performance of products. By obtaining these data through measurements in specific normalized measuring conditions, the consistency of the data should be ensured between different laboratories (within the limits of the declared measurement uncertainty) and comparison of different products on the same basis is possible.

This standard aims in particular to cover measurement methods for testing the compliance of LED devices with the photometric and colorimetric requirements of LED performance standards (see Clause 2) issued by IEC/TC 34 "Lamps and related equipment".

LED devices offer a large variety of configurations in respect to geometry and/or colour. For each configuration the photometric and colorimetric performances are considered individually.

### 1 Scope

This standard specifies the requirements for measurement of electrical, photometric, and colorimetric quantities of LED lamps, LED modules and LED luminaires, for operation with AC or DC supply voltages, possibly with associated LED control gear. LED light engines are assimilated to LED modules and handled accordingly. Photometric and colorimetric quantities covered in this standard include total luminous flux, luminous efficacy, partial luminous flux, luminous intensity distribution, centre-beam intensity, luminance and luminance distribution, chromaticity coordinates, correlated colour temperature (CCT), colour rendering index (CRI), and angular colour uniformity. This standard does not cover LED packages and products based on OLEDs (organic LEDs).

### 2 Normative References

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application.<sup>1</sup> For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CIE S 017/E:2011. *ILV: International Lighting Vocabulary*

CIE DIS 024/E:2015. *Light Emitting Diodes (LEDs) and LED Assemblies – Terms and Definitions*

CIE 13.3:1995. *Method of Measuring and Specifying Colour Rendering of Light Sources*

CIE 15:2004. *Colorimetry, 3<sup>rd</sup> edition*

CIE 84-1989. *Measurement of Luminous Flux*

CIE 121-1996. *The Photometry and Goniophotometry of Luminaires*

CIE 198:2011. *Determination of Measurement Uncertainties in Photometry*

CIE 198-SP1:2011. *Determination of Measurement Uncertainties in Photometry – Supplement 1: Modules and Examples for the Determination of Measurement Uncertainties*

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<sup>1</sup> The referenced IEC/PAS documents are under process to become IEC standards. As soon as published, they will replace the IEC/PAS documents for the purpose of this standard.