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

International Standard

Photometry of road illumination devices, light-signalling devices and retroreflective devices for road vehicles

Photométrie des dispositifs d'éclairage routier, des dispositifs de signalisation lumineuse et des dispositifs rétroréfléchissants pour véhicules routiers

Photometrie von lichttechnischen Einrichtungen zur Straßenbeleuchtung, Signalgebung und Rückstrahleinrichtungen für Straßenfahrzeuge

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Foreword

International Standards produced by the Commission Internationale de l'Eclairage 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 2-67 "Photometry of Lighting and Light-signalling Devices for Road Vehicles" of Division 2 "Physical measurement of light and radiation" of the Commission Internationale de l'Eclairage. The work has been performed in close contact with GTB (Groupe de Travaille Bruxelles 1952) Working Group Photometry, of which most of its members are representatives of technical services accredited for approval testing of light and light signalling devices.

This document has been created for laboratories having the need to perform accurate and reproducible photometric and colorimetric tests required for approval testing according to automotive lighting regulations. It has been developed based on CIE S 025:2015 and partially incorporates the former Photometry Laboratory Accuracy Guidelines, Edition 3, 2014, as stated in GTB document CE-3874.

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Photometry of road illumination devices, light-signalling devices and retroreflective devices for road vehicles

Introduction

This standard provides requirements to perform reproducible photometric and colorimetric measurements on road illumination devices, light-signalling devices and retroreflective devices to be used in road vehicles. It also provides advice for reporting the data and lists major equipment, instrumentation and procedures to record properties of approved lighting devices according to requirements specified in corresponding UN regulations.

The availability of reliable and accurate photometric data for type approval[1] of road illumination devices, light-signalling devices and retroreflective devices is a basic requirement for the comparability between industry and test facilities as well as between technical services and approval authorities. 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.

This standard aims in particular to cover measurement methods for testing the compliance of approved road illumination devices, light-signalling devices and retroreflective devices with the photometric and colorimetric requirements as stated within different UN regulations for a variety of lighting applications in road vehicles. For each photometric and colorimetric property, the possible data acquisition process(es) with their uncertainties are considered individually.

1 Scope

This standard specifies the requirements for measurement of electrical, photometric and colorimetric properties of road illumination devices and light-signalling devices for road vehicles including their light sources as given by various UN regulations. These properties are usually acquired with a DC supply voltage, possibly supplied by an associated electronic light source control gear. This standard also specifies the requirements for measurement of photometric and colorimetric properties of retroreflective devices for road vehicles.

Photometric and colorimetric quantities covered in this standard include total luminous flux, cumulative luminous flux and the distribution thereof, luminous intensity and the distribution thereof, illuminance, luminance, chromaticity coordinates, spatial chromaticity distribution, luminance factor and coefficient of luminous intensity of fluorescent and/or retroreflective surfaces. Geometrical quantities covered in this standard include light emitting area and corresponding contrast ratios of light sources.

NOTE 1 Where the term “device” or “DUT" ("device under test") is used in this document, the term covers light sources (replaceable or non-replaceable), light source modules, road illumination devices, light-signalling devices and retroreflective devices.

NOTE 2 The text within this document is written as technology neutral as possible always trying to provide multiple possibilities for the measurement of a photometric quantity to allow laboratories a maximum of flexibility in recording and analysing the required data.

2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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, *ILV: International Lighting Vocabulary*

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[1] Type approval describes the process applied by national authorities to certify that a model or component of a vehicle meets all EU safety, environmental and conformity of production requirements before authorising it to be placed on the EU market