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Characterization of the performance of illuminance meters and luminance meters

Caractérisation des performances des luxmètres et des luminancemètres

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Foreword

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ISO/CIE 19476 was prepared by CIE Technical Committee 2-40: *Characterizing the performance of illuminance and luminance meters*, as CIE S 023. The committee responsible for this document is ISO/TC 274, *Light and lighting.*

CIE S 023/E:2013

COMMISSION INTERNATIONALE DE L'ECLAIRAGE
INTERNATIONAL COMMISSION ON ILLUMINATION
INTERNATIONALE BELEUCHTUNGSKOMMISSION

International Standard

Characterization of the Performance of Illuminance Meters and Luminance Meters

Caractérisation des performances des luxmètres et des luminancemètres

Kennzeichnung der Güte von Beleuchtungsstärke- und Leuchtdichtemessgeräten

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Quantities related to photometric and other measurements
Calibration

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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 CIE Technical Committee 2-40[1] "Characterizing the Performance of Illuminance and Luminance Meters". It has been approved by the Board of Administration and Division 2 of the Commission Internationale de l'Eclairage as well as by the CIE National Committees. It is supposed to supersede CIE Publication 69-1987.

[1] This TC was chaired by R. Rattunde † (DE) and P. Blattner (CH).
Members were: R. Austin (US), J. Bastie, (FR), T. Bergen (AU), G. Czibula (DE), G. Dezsi (HU), T. Goodman (GB), K.C. Khandelwal (IN), T.Q. Khanh (DE), U. Krüger (DE), J. Mahidharia (IN), Y. Ohno (US), J. Pan (CN), J. Pietrzykowski (PL), I. Saito (JP), G. Sauter (DE), J. Schanda (HU), H. Shitomi (JP), A. Sperli ng (DE), W. Steudtner (DE), R. Stolyarevskaya (RU), H.-G. Ulrich (DE), G. Vandermeersch (BE), P. Vukadin (RS), X. Gan (SG), R. Young (GB).

CONTENTS

Characterization of the Performance of Illuminance Meters and Luminance Meters

1 Scope

This CIE International Standard is applicable to illuminance and luminance meters. The Standard defines quality indices characterizing the performance of such devices in a general lighting measurement situation, as well as measurement procedures for the individual indices and standard calibration conditions.

Measurements of illuminance or luminance and their accuracy are influenced by various parameters, such as operational conditions, properties of light sources, as well as characteristics of the applied photometers. The characteristics of these photometers alone do not allow the determination of the measurement uncertainty for a specific measurement task. Nevertheless, it is generally true that instruments with “better” characteristics in most cases produce smaller uncertainties than instruments with “worse” properties. This Standard has been written to:

- give clear and unambiguous definitions for the individual quality indices;
- define measurement procedures and methods for numerical evaluation of these quality indices;
- define calibration conditions for illuminance meters and luminance meters.

Where different, the definitions of the quality indices and the associated measurement procedures and methods for numerical evaluation given in this Standard supersede those given in CIE Publication 53-1982. CIE publication 69-1987 shall be superseded by this Standard.

2 Normative References

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

CIE 202:2011 Spectral Responsivity Measurement of Detectors, Radiometers and Photometers

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

ISO 11664-2:2007/CIE S 014-2:2006 Colorimetry – Part 2: CIE Standard Illuminants

ISO 23539:2005/CIE S 010:2004 Photometry – The CIE System of Physical Photometry

CIE 198:2011 Determination of Measurement Uncertainties in Photometry

CIE 114/4-1994 CIE Collection in Photometry and Colorimetry - Distribution Temperature and Ratio Temperature

IEC 60051-1:1997 Direct acting indicating analogue electrical measuring instruments and their accessories – Part 1: Definitions and general requirements common to all parts

ISO/IEC Guide 98-3:2008[1] Uncertainty of measurement -- Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)

ISO/IEC Guide 99:2007[2] International Vocabulary of Metrology — Basic and General Concepts and Associated Terms (VIM).

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1 Also referred as JCGM 100:2008, available from BIPM webpage.

2 Also referred as JCGM 200:2008, available from BIPM webpage.