BS EN 13201-4:2015

BSI Standards Publication

Road lighting

Part 4: Methods of measuring lighting performance

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National foreword

This British Standard is the UK implementation of EN 13201-4:2015. It supersedes BS EN 13201-4:2003 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EL/1/2, Road lighting.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Road lighting - Part 4: Methods of measuring lighting performance

Éclairage public - Partie 4 : Méthodes de mesure des performances photométriques

Straßenbeleuchtung - Teil 4: Methoden zur Messung der Gütemerkmale von Straßenbeleuchtungsanlagen

This European Standard was approved by CEN on 6 June 2015.

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European foreword

This document (EN 13201-4:2015) has been prepared by Technical Committee CEN/TC 169 “Light and lighting”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2016 and conflicting national standards shall be withdrawn at the latest by June 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13201-4:2003.

The main technical changes in this version are:

— The definition of different aims of measurement with peculiar requirements in order to optimize the instrument characteristics, measurement cost and time;

— A deeper comparison between static and dynamic measurement requirements;

— Addition of specific requirements for ILMD (Image Luminance Measuring Device) when used as luminance meter;

— Evaluation of measurement uncertainty;

— Comparison with requirements or design expectation carried out considering the expanded measurement uncertainty of the measure;

— Addition of guidelines for the measurement of Threshold Increment and of Edge Illuminance Ratio;

— Suggestion for an algorithm for the evaluation of tolerances in road lighting installation design;

— Description of the concept of particular parameters in order to consider measurements carried out in condition different from the normative ones;

— Description of an improved convention for symbols of photometric quality parameters in order to avoid confusion between values of the same parameter but with different meanings;

— Measurement systems for adaptive road lighting are considered;

— Guidelines for the measurement uncertainty evaluation are given.

This document EN 13201-4 has been worked out by the Joint Working Group of CEN/TC 169 “Light and lighting” with CEN/TC 226 “Road Equipment”, the secretariat of which is held by AFNOR.

EN 13201, *Road lighting* is a series of documents that consists of the following parts:

— *Part 1: Guidelines on selection of lighting classes* [Technical Report]*;*

— *Part 2: Performance requirements;*

— *Part 3: Calculation of performance;*

— *Part 4: Methods of measuring lighting performance* [present document]*;*

— *Part 5: Energy performance indicators.*

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The purpose of Part 4 of this European Standard is to:

a) establish conventions and procedures for the characterization based on measurements of road lighting installations considering the photometric quality parameters, i.e. the set of quantities that characterize a lighting class, specified in Part 2;

b) give advice on the use and selection of luminance meters and illuminance meters for this particular application;

c) specify measurement requirements according to the aims of the measurement and expected accuracy;

d) establish conventions for evaluating the measurement uncertainty of involved parameters;

e) give information on the application of tolerance analysis in the design of the lighting installation.

A non-exhaustive list of possible measurement aims is:

f) verification of compliance with standard requirements;

g) verification of compliance with design expectations;

h) road lighting installation monitoring, e.g. for maintenance purposes;

i) road lighting installation control, e.g. for optimizing energy saving;

j) investigation of discrepancies between real lighting conditions and design expectations.

The conventions for observer position and location of measurement points are those adopted in EN 13201-3. However, relaxation from these is permitted especially where the measurements are used for monitoring the performance of a road lighting installation, to control its performances or other purposes or when different conditions are specified in the road lighting installation design.

Conditions, which can lead to inaccuracies, are identified and precautions are given to minimize and quantify these.

This standard should be used to write measurement procedures for the characterization of road lighting installations.

Criteria for deciding when measurements should be done, on the purpose of measurements and on how the measurement results shall be used fall outside the scope of this standard.

1 Scope

This European Standard specifies measurement conditions and procedures for measuring the photometric quality parameters of road lighting installations, i.e. the quantities that quantify their performances in accordance with EN 13201-2 lighting classes.

Parameters used for quantifying the energy performance of road lighting installations are not considered.

A methodology to evaluate the road lighting performances considering tolerances in the design parameters is described in the informative Annex A.

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.

EN 12665, *Light and lighting — Basic terms and criteria for specifying lighting requirements*

EN 13032-1, *Light and lighting — Measurement and presentation of photometric data of lamps and luminaires — Part 1: Measurement and file format*

EN 13201-2, *Road lighting — Part 2: Performance requirements*

EN 13201-3:2015, *Road lighting — Part 3: Calculation of performance*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12665 and the following apply.

3.1
automatic measuring system for control purpose
automatic system used to generate a control signal, correlated to one or more measured photometric parameters that can influence the operating conditions of a road lighting installation

Note 1 to entry: Metrological parameters, such as measurement repeatability and stability, generally are the main characteristic of the system.

3.2
dynamic measurement system
measurement system that moves along the road surface to carry out the measurement

3.3
static measurement system
measurement system that does not move when in service

3.4
parameter (normative)
quantity defined in EN 13201-2 following calculation rules of EN 13201-3

Note 1 to entry: The value of the parameter can:

a) give standard requirements;