BS EN IEC 60809:2021

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

BSI Standards Publication

Lamps and light sources for road vehicles — Dimensional, electrical and luminous requirements

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

National foreword

This British Standard is the UK implementation of EN IEC 60809:2021. It is identical to IEC 60809:2021. It supersedes BS EN IEC 60809:2015+A3:2019, which will be withdrawn on 14 December 2021.

The UK participation in its preparation was entrusted to Technical Committee CPL/34/1, Electric lamps.

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

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2021
Published by BSI Standards Limited 2021

ISBN 978 0 539 13645 6

ICS 29.140.20; 43.040.20

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 June 2021.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD **EN IEC 60809**

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

EUROPÄISCHE NORM

May 2021

ICS 43.040.20; 29.140.20

Supersedes EN 60809:2015 and all of its amendments and corrigenda (if any)

English Version

Lamps and light sources for road vehicles - Dimensional, electrical and luminous requirements (IEC 60809:2021)

Lampes et sources lumineuses pour véhicules routiers - Exigences dimensionnelles, électriques et lumineuses (IEC 60809:2021)

Lampen und Lichtquellen für Straßenfahrzeuge - Maße, elektrische und lichttechnische Anforderungen (IEC 60809:2021)

This European Standard was approved by CENELEC on 2021-05-12. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2021 CENELEC All rights of exploitation in any form and by any means reserved worldwide for CENELEC Members.

Ref. No. EN IEC 60809:2021 E

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

European foreword

The text of document 34A/2232/FDIS, future edition 4 of IEC 60809, prepared by SC 34A "Electric light sources" of IEC/TC 34 "Lighting" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60809:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2022-02-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-05-12

This document supersedes EN 60809:2015 and all of its amendments and corrigenda (if any).

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

Endorsement notice

The text of the International Standard IEC 60809:2021 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60983	NOTE	Harmonized as EN 60983
IEC 62504	NOTE	Harmonized as EN 62504

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60050-845	-	International Electrotechnical Vocabulary. Lighting	-	-
IEC 60051-1	-	Direct acting indicating analogue electrical measuring instruments and their accessories - Part 1: Definitions and general requirements common to all parts	EN 60051-1	-
IEC 60061-1	-	Lamp caps and holders together with gauges for the control ofinterchangeability and safety. Part 1: Lamp caps	EN 60061-1	-
IEC 60810	2017	Lamps, light sources and LED packages for road vehicles - Performance requirements	EN IEC 60810	2018
+ A1	2019		+ A1	2019
CIE 015	-	Colorimetry	-	-

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

This page deliberately left blank

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

CONTENTS

FOREWORD 8
1 Scope 10
2 Normative references 10
3 Terms and definitions 12
4 Requirements and test conditions for filament lamps 15
4.1 General requirements 15
4.2 Lamp marking 15
4.3 Bulbs 15
4.4 Colour 15
4.4.1 Colour of light 15
4.4.2 Colour endurance 17
4.4.3 Coated bulb 17
4.5 Lamp dimensions 17
4.6 Caps and bases 18
4.7 Initial electrical and luminous requirements 18
4.8 Check on optical quality 18
4.8.1 General 18
4.8.2 12 V lamps emitting white light 18
4.8.3 6 V and 24 V lamps emitting white light 18
4.8.4 Lamps emitting selective-yellow light 19
4.9 UV radiation 19
4.10 Standard (étalon) filament lamps 19
4.11 Non-replaceable filament lamps 20
4.11.1 General 20
4.11.2 Fixation 21
4.11.3 Lifetime 21
4.11.4 Colour endurance 22
4.11.5 Luminous flux and colour maintenance 22
4.11.6 Vibration and shock resistance 22
5 Requirements and test conditions for discharge lamps 22
5.1 General requirements 22
5.2 Lamp marking 22
5.3 Bulbs 23
5.4 Caps 23
5.5 Position and dimensions of electrodes, arc and black stripes 23
5.5.1 Measurements 23
5.5.2 Electrodes 23
5.5.3 Arc 23
5.5.4 Black stripes 23
5.6 Starting, run-up and hot-restrike characteristics 24
5.6.1 Starting 24
5.6.2 Run-up 24
5.6.3 Hot-restrike 24
5.6.4 Compliance 24
5.7 Electrical and photometric characteristics 25
5.7.1 Voltage and wattage 25
5.7.2 Luminous flux 25

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

5.7.3 Compliance ... 25
5.8 Colour ... 25
5.9 UV radiation ... 26
5.10 Standard (étalon) discharge lamps ... 27
6 Requirements and test conditions for LED light sources ... 27
6.1 General requirements ... 27
6.2 Light source marking ... 27
6.3 Optical surfaces ... 27
6.4 Colour of light ... 27
6.5 Lamp dimensions ... 27
6.6 Caps and bases ... 28
6.7 Initial electrical and photometrical requirements ... 28
6.8 Red content ... 28
6.9 UV radiation ... 29
6.10 Standard (étalon) light sources ... 29
7 Sampling and conditions of compliance ... 29
8 Lamp data sheets ... 29
8.1 General ... 29
8.2 List of specific lamp types ... 30
8.3 Data sheets not transferred to UN R.E.5 ... 34
Annex A (normative) Filament shape, length and position ... 54
A.1 General ... 54
A.2 Filaments shown as points ... 54
A.3 Line filaments ... 54
A.4 Coiled-coil filaments ... 54
A.5 Extreme filament turns ... 54
A.6 Filament extremities ... 54
A.6.1 General ... 54
A.6.2 Axial filaments ... 54
A.6.3 Transverse filaments ... 54
A.7 Determination of filament length ... 55
A.8 Filament offsets ... 55
A.9 Lateral deviation ... 55
A.10 Filament location check system (box system) ... 55
Annex B (normative) Measurement method of the colour of filament lamps ... 58
B.1 General ... 58
B.2 Colour ... 58
B.3 Measuring directions ... 58
B.3.1 General ... 58
B.3.2 Filament lamps used in headlamps ... 58
B.3.3 Filament lamps used in light signalling devices ... 59
Annex C (normative) Test conditions for electrical and luminous characteristics ... 60
C.1 Filament lamps ... 60
C.1.1 Ageing ... 60
C.1.2 Test conditions ... 60
C.1.3 Electrical instrumentation ... 60
C.1.4 Photometry ... 60
C.2 LED light sources ... 60

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

C.2.1 Test conditions 60
C.2.2 Luminous flux 60
C.2.3 Normalized luminous intensity 61
C.2.4 Colour 61
C.2.5 Power consumption 61
C.2.6 Luminous flux and colour at elevated temperature 62
Annex D (normative) Measurement method of internal elements of R2 lamps 65
D.1 General test conditions 65
D.1.1 Measurement position 65
D.1.2 Ageing 65
D.1.3 Test conditions 65
D.2 Reference axis, reference plane and planes for measurements 65
D.2.1 Reference axis 65
D.2.2 Reference plane 65
D.2.3 Plane V-V 65
D.2.4 Plane H-H 65
D.2.5 Plane X-X 65
D.2.6 Plane Y1-Y1 65
D.2.7 Plane Y2-Y2 65
D.3 Viewing directions (see Figure D.1) 66
D.3.1 Viewing direction ① 66
D.3.2 Viewing direction ② 66
D.3.3 Viewing direction ③ 66
D.4 Measuring points (MP) 66
D.5 Dimensions to be measured 67
Annex E (normative) Measurement method of internal elements of H4 and HS1 lamps 70
E.1 General test conditions 70
E.1.1 Measurement position 70
E.1.2 Ageing 70
E.1.3 Test conditions 70
E.2 Reference axis, reference plane and planes for measurement 70
E.2.1 Reference axis 70
E.2.2 Reference plane 70
E.2.3 Plane V-V 70
E.2.4 Plane H-H 70
E.2.5 Plane X-X 70
E.2.6 Plane Y1-Y1 70
E.2.7 Plane Y2-Y2 71
E.2.8 Plane Y3-Y3 71
E.2.9 Plane Y4-Y4 71
E.2.10 Plane Y5-Y5 71
E.3 Viewing directions (see Figure E.1) 71
E.3.1 Viewing direction ① 71
E.3.2 Viewing direction ② 71
E.3.3 Viewing direction ③ 71
E.3.4 Viewing direction ④ 71
E.4 Measuring points (MP) 71
E.4.1 General 71

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

E.4.2 Shield and filaments (see Figure E.2) 72
E.4.3 Top obscuration (see Figure E.3) 72
E.5 Dimensions to be measured 72
Annex F (normative) Measurement method of internal elements of HB1 lamps 77
F.1 General test conditions 77
F.1.1 Measurement position 77
F.1.2 Ageing 77
F.1.3 Test conditions 77
F.2 Dipped-beam filament location 77
F.2.1 Horizontal location 77
F.2.2 Vertical location 77
F.2.3 Axial location 77
F.3 Main-beam filament location 77
F.3.1 Horizontal location 77
F.3.2 Vertical location 77
F.3.3 Axial location 78
Annex G (informative) Optical set-up for the measurement of the position and form of the arc and of the position of the electrodes of discharge lamps 79
Annex H (normative) Measurement method of electrical and photometric characteristics of discharge lamps 80
H.1 General 80
H.2 Ballast 80
H.3 Burning position 80
H.4 Ageing 80
H.5 Supply voltage 80
H.6 Starting test 80
H.7 Run-up test 80
H.8 Hot restrike test 80
H.9 Electrical and photometric test 81
H.10 Colour 81
Annex I (informative) Overview of lamp types and their applications 82
Annex J (normative) Test conditions for colour endurance measurements 85
J.1 General 85
J.2 Calibration and ageing 85
J.3 Test voltage 86
J.4 Operating position 86
J.5 Test rack 86
J.6 Operating cycles 86
J.7 Closure 89
Annex K (informative) Method(s) to determine the value of the light centre length for Lx3A, Lx3B, Lx4A, Lx4B, Lx5A, Lx5B, L1A/6 and L1B/6 90
K.1 Measurement and calculation method based on ray tracing 90
K.2 Alternative method 91
Annex L (informative) Method to determine the maximum luminance gradient of LED light sources 92
L.1 Measuring the luminance 92
L.2 Calculating the maximum luminance gradient 92
Bibliography 94

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

Figure A.1 – Determination of apexes, filament length and filament offsets (A and B) 56
Figure A.2 – Determination of filament centre 56
Figure A.3 – Determination of lateral deviations (A and B) and tolerance on the light centre length (C) 57
Figure B.1 – Positions of the colorimetric receiver when measuring lamps used in headlamps 59
Figure B.2 – Positions of the colorimetric receiver when measuring lamps used in light signalling devices 59
Figure C.1 – Schematic representation of the set-up to measure the luminous flux and colour at elevated temperature 63
Figure C.2 – Schematic representation of the set-up to measure the luminous flux and colour at elevated temperature 64
Figure D.1 – Viewing directions, seen from the top of the lamp 68
Figure D.2 – Position of measuring points of R2 lamps 69
Figure E.1 – Viewing directions, seen from the top of the lamp 74
Figure E.2 – Position of measuring points of H4, H17, H19 and HS1 lamps 75
Figure E.3 – Top obscuration 76
Figure F.1 – Side view, view from ③[ab] 78
Figure F.2 – Plan view, view from ④[a] 78
Figure G.1 – Optical system 79
Figure J.1 – Side view of box 86
Figure J.2 – Front view of box 86
Figure J.3 – Temperature in the climate chamber during one operating cycle 87
Figure J.4 – Relative humidity in the climate chamber during one operating cycle 87
Figure J.5 – Switching modes of filament lamps for intermittent operation during one operating cycle 88
Figure J.6 – Switching modes of filament lamps for intermittent and continuous operation during one operating cycle 88
Figure J.7 – Switching modes of filament lamps for continuous operation during one operating cycle 89
Figure J.8 – Switching modes of filament lamps for intermittent and continuous operation during one operating cycle 89
Figure K.1 – Set-up to measure the luminance distribution of the A versions of the LED light sources 90
Figure K.2 – Set-up to measure the luminance distribution of the B versions of the LED light sources 91
Figure L.1 – Example of a luminance image and the calculated average luminance values $L(x)$ 93
Figure L.2 – Example for 1 µm-interpolation and position of maximum luminance gradient 93

Table 1 – Lifetime of non-replaceable light sources used in devices (luminaires) 21
Table 2 – Spectral weighting function 26
Table 3 – List of specific lamp types 30
Table C.1 – Luminous flux tolerance limits 61
Table D.1 – Dimensions to be measured for R2 lamps 67
Table E.1 – Dimensions to be measured for H4, H17, H19 and HS1 lamps 73

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

Table I.1 – Overview of lamp types and their applications 82
Table J.1 – Applicable switching modes 85
Table J.2 – Applicable boxes of the test racks 85
Table J.3 – Dimensions of the applicable boxes and the relative position of the centre of the filament 86
Table J.4 – Timing during one operating cycle 87
Table J.5 – Switching modes of the filament lamps 88

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

LAMPS AND LIGHT SOURCES FOR ROAD VEHICLES – DIMENSIONAL, ELECTRICAL AND LUMINOUS REQUIREMENTS

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60809 has been prepared by subcommittee 34A: Electric light sources, of IEC technical committee 34: Lighting. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2014, Amendment 1:2017, Amendment 2:2017 and Amendment 3:2019. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) Introduction of a light technical measurement on LED light sources intended for use in front-lighting applications.
b) As the original data sheets and some figures from previous editions were not available in an editable format, they have been reproduced from their old format, following the current drafting rules and are now in single language format. Some reproductions constitute minor (obvious) editorial changes of the original text sections and original figures; no technical changes were introduced.

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

The text of this International Standard is based on the following documents:

Draft	Report on voting
34A/2232/FDIS	34A/2235/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

This is a preview of "BS EN IEC 60809:2021". Click here to purchase the full version from the ANSI store.

LAMPS AND LIGHT SOURCES FOR ROAD VEHICLES – DIMENSIONAL, ELECTRICAL AND LUMINOUS REQUIREMENTS

1 Scope

This document is applicable to electric light sources (see Note 1) for use in automotive applications, for example in road illumination devices and/or light signalling devices for road vehicles.

It is especially applicable to light sources listed in UN Resolution R.E.5 and light sources subject to other legislations.

This document specifies the technical requirements for interchangeability for example dimensional, electrical and photometrical characteristics, and includes test methods.

For the light sources listed in this document, the data sheets are contained either in this document or are included by reference to UN Resolution R.E.5.

Performance requirements are specified in IEC 60810, for example life, torsion strength, resistance to vibration and shock.

The requirements for miniature light sources for supplementary purposes, not subject to legislation, are specified in IEC 60983.

NOTE 1 The terms "lamp" and "light source" are both used in this document to mean the same product, so the two terms are interchangeable throughout this document.

NOTE 2 In various vocabularies and standards, different terms are used for "incandescent lamp" (IEC 60050-845:1987, 845-07-04), "discharge lamp" (IEC 60050-845:1987, 845-07-17) and "LED lamp". In this document "filament lamp", "discharge lamp" and "LED light source" are used, however, where only "lamp" or "light source" is written, all light sources, independent of the technology used, are meant, unless the context clearly shows that it applies to one kind of technology only. In the UN Regulations, the word "light source" is used for the products specified in this document.

NOTE 3 Wherever the term "device" is used, it is meant to designate equipment which is used as a luminaire. It can for instance take the form and purpose of a headlight or signal light.

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.

IEC 60050-845, *International Electrotechnical Vocabulary – Part 845: Lighting* (available at http://www.electropedia.org/)

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

IEC 60061-1, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 1: Lamp caps* (available at http://std.iec.ch/iec60061)

IEC 60810:2017, *Lamps, light sources and LED packages for road vehicles – Performance requirements*
IEC 60810:2017/AMD1:2019