



BSI Standards Publication

Lamps for road vehicles - Dimensional, electrical and luminous requirements

This is a preview of "BS EN IEC 60809:2015...". [Click here to purchase the full version from the ANSI store.](#)

National foreword

This British Standard is the UK implementation of EN IEC 60809:2015, including amendment A1:2017 and amendment A2:2017. It is identical to IEC 60809:2014, including amendment 1:2017 and amendment 2:2017. It supersedes BS EN 60809:2015, which is withdrawn.

The text of IEC amendment 1:2017 and IEC amendment 2:2017 has been provided in its entirety at the beginning of this document. BSI's policy of providing consolidated content remains unchanged; however, in the interest of expediency, in this instance BSI have chosen to collate the relevant content at the beginning of this document.

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 secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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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 31 March 2015.

Amendments/corrigenda issued since publication

Date	Text affected
31 March 2018	Implementation of IEC amendment 1:2017 with CENELEC endorsement A1:2017 and IEC amendment 2:2017 with CENELEC endorsement A2:2018

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EUROPÄISCHE NORM

March 2015

ICS 43.040.20; 29.140.20

Supersedes EN 60809:1996

English Version

Lamps for road vehicles - Dimensional, electrical and luminous requirements (IEC 60809:2014)

Lampes pour véhicules routiers - Exigences dimensionnelles, électriques et lumineuses
(IEC 60809:2014)

Lampen für Straßenfahrzeuge - Maße, elektrische und lichttechnische Anforderungen
(IEC 60809:2014)

This European Standard was approved by CENELEC on 2015-01-20. 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.

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

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Foreword

The text of document 34A/1798/FDIS, future edition 3 of IEC 60809, prepared by SC 34A "Lamps", of IEC/TC 34 "Lamps and related equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60809:2015.

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) 2015-10-20
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-01-20

This document supersedes EN 60809:1996.

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Endorsement notice

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(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 When 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050	series	International electrotechnical vocabulary	-	-
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 of interchangeability and safety - Part 1: Lamp caps	EN 60061-1	-
IEC 60810	2014	Lamps for road vehicles - Performance requirements	EN 60810	2015
IEC 60983	-	Miniature lamps	EN 60983	-
IEC 62504	-	General lighting - Light emitting diode (LED) products and related equipment - Terms and definitions	EN 62504	-
CIE 15	2004	Colorimetry	-	-
UNECE 1958 Agreement	-	Agreement concerning the adoption of uniform technical prescription for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions	-	-
UNECE 4	-	1958 Agreement, Addendum 3: Regulation No. 4: Uniform provisions concerning the approval of devices for the illumination of rear registration plates of power-driven vehicles and their trailers	-	-
UNECE 6	-	1958 Agreement, Addendum 5: Regulation No. 6: Uniform provisions concerning the approval of direction indicators for power-driven vehicles and their trailers	-	-

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UNECE 7	-	1958 Agreement, Addendum 6: Regulation No. 7: Uniform provisions concerning the approval of front and rear position lamps, stop-lamps and end-outline marker lamps for motor vehicles (except motor cycles) and their trailers	-	-
UNECE 23	-	1958 Agreement, Addendum 22: Regulation No. 23: Uniform provisions concerning the approval of reversing and manoeuvring lamps for power-driven vehicles and their trailers	-	-
UNECE 37	-	1958 Agreement, Addendum 36: Regulation No. 37: Uniform provisions concerning the approval of filament lamps for use in approved lamp units of power-driven vehicles and of their trailers	-	-
UNECE 38	-	1958 Agreement, Addendum 37: Regulation No. 38: Uniform provisions concerning the approval of rear fog lamps for power-driven vehicles and their trailers	-	-
UNECE 50	-	1958 Agreement, Addendum 49: Regulation No. 50: Uniform provisions concerning the approval of front position lamps, rear position lamps, stop lamps, direction indicators and rear-registration-plate illuminating devices for vehicles of category L	-	-
UNECE 77	-	1958 Agreement, Addendum 76: Regulation No. 77: Uniform provisions concerning the approval of parking lamps for power-driven vehicles	-	-
UNECE 87	-	1958 Agreement, Addendum 86: Regulation No. 87: Uniform provisions concerning the approval of daytime running lamps for power-driven vehicles	-	-
UNECE 91	-	1958 Agreement, Addendum 90: Regulation No. 91: Uniform provisions concerning the approval of side-marker lamps for motor vehicles and their trailers	-	-
UNECE 99	-	1958 Agreement, Addendum 98: Regulation No. 99: Uniform provisions concerning the approval of gas-discharge light sources for use in approved gas-discharge lamp units of power-driven vehicles	-	-
UNECE 101	-	1958 Agreement, Addendum 100: Regulation No. 101: Uniform provisions concerning the approval of passenger cars powered by an internal combustion engine only, or powered by a hybrid electric power train with regard to the measurement of the emission of carbon dioxide and fuel consumption and/or the measurement of electric energy consumption and electric range, and of categories M ₁ and N ₁ vehicles powered by an electric power train only with regard to the measurement of electric energy consumption and electric range	-	-
UNECE 119	-	1958 Agreement, Addendum 118: Regulation No. 119: Uniform provisions concerning the approval of cornering lamps for power-driven vehicles	-	-
UNECE 128	-	1958 Agreement, Addendum 127: Regulation No. 128: Uniform provisions concerning the approval of light emitting diode (LED) light sources for use in approved lamp units on power-driven vehicles and their trailers	-	-

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EUROPÄISCHE NORM

July 2017

ICS 29.140.20; 43.040.20

English Version

Lamps for road vehicles -
Dimensional, electrical and luminous requirements
(IEC 60809:2014/A1:2017)

Lampes pour véhicules routiers - Exigences
dimensionnelles, électriques et lumineuses
(IEC 60809:2014/A1:2017)

Lampen für Straßenfahrzeuge - Maße, elektrische und
lichttechnische Anforderungen
(IEC 60809:2014/A1:2017)

This amendment A1 modifies the European Standard EN 60809:2015; it was approved by CENELEC on 2017-05-03. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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European foreword

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February 2018

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English Version

Lamps for road vehicles - Dimensional, electrical and luminous requirements (IEC 60809:2014/A2:2017)

Lampes pour véhicules routiers - Exigences dimensionnelles, électriques et lumineuses
(IEC 60809:2014/A2:2017)

Lampen für Straßenfahrzeuge - Maße, elektrische und lichttechnische Anforderungen
(IEC 60809:2014/A2:2017)

This amendment A2 modifies the European Standard EN 60809:2015; it was approved by CENELEC on 2017-12-15. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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European foreword

The text of document 34A/2032/FDIS, future edition 1 of IEC 60809:2014/A2:2017, prepared by IEC/TC 34A "Lamps" of IEC/TC 34 "Lamps and related equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60809:2015/A2:2018.

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- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-12-15

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Edition 3.0 2017-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

Lamps for road vehicles – Dimensional, electrical and luminous requirements

Lampes pour véhicules routiers – Exigences dimensionnelles, électriques et lumineuses

INTERNATIONAL
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

IEC 60809
Edition 3.0 2014-12

**LAMPS FOR ROAD VEHICLES –
DIMENSIONAL, ELECTRICAL AND LUMINOUS REQUIREMENTS**

INTERPRETATION SHEET 1

This interpretation sheet has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

The text of this interpretation sheet is based on the following documents:

ISH	Report on voting
34A/2007/ISH	34A/2017/RVD

Full information on the voting for the approval of this interpretation sheet can be found in the report on voting indicated in the above table.

IMPORTANT – The 'colour inside' logo on the cover page of this publication 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.

Introduction (not part of the proposal)

In the Amendment 1 to Ed.3 (34A/1901/CDV voted positively), Annex E was updated to extend the method of measuring internal elements of dual filament lamps to all such categories, for instance the new category H19.

In the amendment of the current category sheet for H19 (Regulation No. 37), the distinct physical shield width B is introduced ($8,6 \pm 0,3$ mm) to ensure interchangeability of light sources as it relates to road safety (see WP.29/2016/111; to become Resolution [R.E.5] on the common specification of light source categories). In the category sheet for H19 reference is made to Annex E of IEC 60809:2014 for the method of measurement of the internal elements.

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See in Figure 1 an extract from WP.29/2016/111.

Practical measurement set-ups use optical vision-systems like a projection system to determine the dimensions of the internal elements.

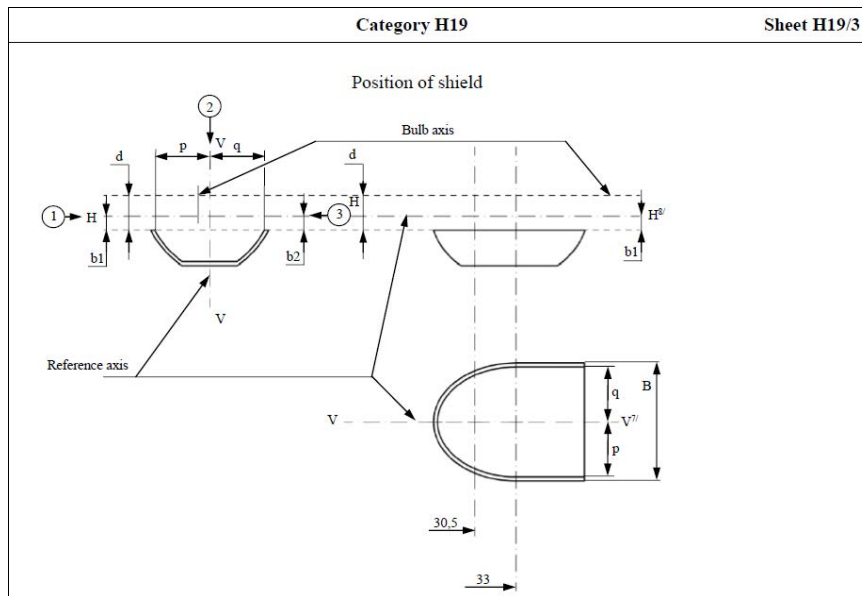


Figure 1 – Category sheet for H19

Problem statement:

When using the above mentioned vision system, a measurement error is introduced due to refraction and blurring (by the glass envelope), additional to the measurement uncertainty.

The effect is mainly dependent on the shield width in relation to the glass envelope diameter.

For lamp designs with a relatively small glass envelope diameter (there is only an upper limit specified), the shield gets close to the glass envelope and the effect becomes significant.

Figure 2 shows a simplified drawing of the view imaging situations of the shield, with and without the effect due to the “refractive index” of the glass envelope.

- Physical dimension “B” when the glass envelope is removed,
- Visual size of the shield width when measured through the glass envelope in direction ②, resulting in a “smaller value for “B”.
- Visual size of the shield width when measured through the glass envelope in direction “-②” (the opposite direction as defined in IEC 60809:2014/AMD1:2017), even show the contrary deviation from the real dimension, resulting in a “larger value for “B”.

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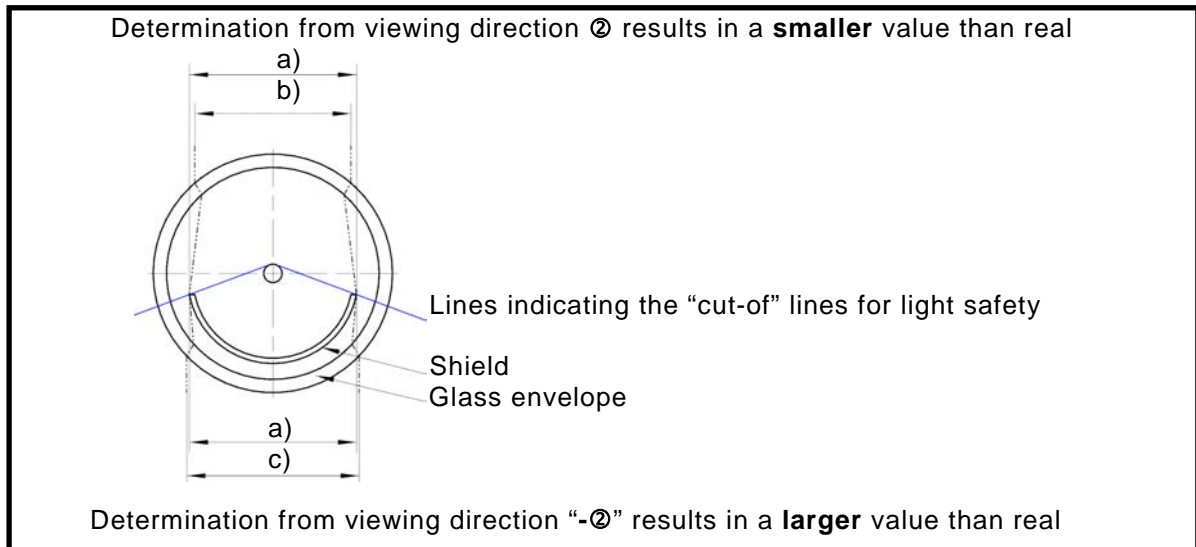


Figure 2 – Simplified drawing of the imaging situations

Proposal:

To publish an Interpretation Sheet on Clause E.5 of IEC 60809:2014/AMD1:2017, *Lamps for road vehicles – Dimensional, electrical and luminous requirements*, as follows:

INTERPRETATION SHEET

Clause E.5 of IEC 60809:2014/AMD1:2017, *Lamps for road vehicles – Dimensional, electrical and luminous requirements*

Note to MP 24 to MP 25 in Table E.1

To avoid measurement errors of the shield width B due to the refractions by the glass envelope the following options are considered:

- 1) The removal of the glass envelope.
- 2) The use of X-ray measurement.

NOTE 1 Option 1 can be used for verification.

- 3) The use of an immersion fluid inside and outside of the envelope in a rectangular glass bath ensuring the refractive index of the immersion fluid matches that of the glass envelope close enough to avoid refractions. The immersion fluid can be filled inside the envelope after removing the top of the bulb. Care shall be taken not to touch/move internal elements.

NOTE 2 Option 1 can be used for verification of the immersion fluid and the test setup.

- 4) The use of a correction factor, taking into account the optical offset and the measurement uncertainty. The verification of the correction factor for a certain lamp design shall be made according the measurement method under item "1)" i.e. after removal of the glass envelope.

NOTE 3 Option 1 can be used for verification.

Note to this interpretation sheet:

The next revision of this standard shall incorporate an improvement of the body text to eliminate the need for this interpretation sheet.

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FOREWORD

This amendment has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

The text of this amendment is based on the following documents:

CDV	Report on voting
34A/1901/CDV	34A/1940/RVC

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

The contents of the interpretation sheet 1 of July 2017 have been included in this copy.

4.4.1 Colour of light

Add, after the third dashed list item (definition of red colour), the following new text:

- finished filament lamps emitting amber light:
 - A₁₂ green boundary: $y = x - 0,120$
 - A₂₃ the spectral locus²
 - A₃₄ red boundary: $y = 0,390$
 - A₄₁ white boundary: $y = 0,790 - 0,670 x$
- With intersection points:
- A₁: $x = 0,545, y = 0,425$
 - A₂: $x = 0,560, y = 0,440$
 - A₃: $x = 0,609, y = 0,390$
 - A₄: $x = 0,597, y = 0,390$

Annex E

Replace the existing title with the following new title:

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Method of measuring internal elements of H4, H17, H19 and HS1 lamps

E.2.6 Plane Y1-Y1

Replace the existing paragraph with the following new text:

Plane Y1-Y1 is a plane parallel to the reference plane at a distance of 29,5 mm from it (30,0 mm for the 24 V type, 30,5 mm for category H19).

E.2.8 Plane Y3-Y3

Replace the existing paragraph with the following new text:

Plane Y3-Y3 is a plane parallel to the reference plane at a distance of 23,5 mm from it (25,0 mm for categories HS1 and H17, 24,5 mm for category H19).

E.3 Viewing directions (see Figure E.1)

Add, at the end of Clause E.3, the following new sub-clause:

E.3.4 Viewing direction ④

Viewing direction ④ is perpendicular to plane V-V, seen from the side of the right-hand shield edge.

E.4.1 Shield and filaments (see Figure E.2)

Replace the existing text with the following new text:

Viewing direction ①

MP 1 and MP 2	The intersections of the main beam filament axis with planes Y3-Y3 and Y4-Y4
MP 3 and MP 4	The intersections of the shield edge with planes Y1-Y1 and Y2-Y2
MP 5 and MP 6	The intersections of the envelope of the dipped beam filament with planes Y1-Y1 and Y2-Y2 farthest from plane H-H
MP 7	The intersection of the bulb axis with plane Y1-Y1
MP 8 and MP 11	The intersections of the outer part of respectively the first and last luminous turns of the dipped beam filament with the shield edge
MP 9 and MP 10	The intersections of the outer part of respectively the first and last luminous turns of the main beam filament with the centre line (axis) of that filament

Viewing direction ②

MP 12 and MP 13	The intersections of the main beam filament axis with planes Y3-Y3 and Y4-Y4
MP 14 and MP 15	The intersections of the dipped beam filament axis with planes Y1-Y1 and Y2-Y2
MP 16 and MP 17	The intersections of the interior shield edges with plane Y2-Y2

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MP 24 and MP 25	The intersections of the outer shield edges with plane Y2-Y2 (including shield material thickness; applies to category H19 only)
Viewing direction ③	(Categories H4 and HS1. Can be used as an equivalent alternative to viewing direction for categories H17 or H19)
MP 18 and MP 19	The intersections of the shield edge with plane Y1-Y1 and Y2-Y2
Viewing direction ④	(Categories H17 and H19. Not for category H4 nor HS1)
MP 18 and MP 19	The intersections of the shield edge with plane Y1-Y1 and Y2-Y2

E.5 Dimensions to be measured

Replace the existing paragraph with the following new text:

Table E.1 states the dimensions to be measured. Values and tolerances are given on the relevant filament lamp data sheet H4, H17, H19 or HS1 of UN Regulation 37.

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Replace the existing Table E1 with the following new Table E.1

Table E.1 – Dimensions to be measured for H4, H17, H19 and HS1 lamps

Distance (see Figure E.2)	Measured perpendicular to plane	Viewing direction	Dimension	
			12 V	24 V
MP 2 to MP 3	H-H	1	a/26,0	
MP 1 to MP 3 ^a	H-H	1	a/23,5	
MP 3 to H-H ^d	H-H	1	b ₁ /29,5	b ₁ /30,0
MP 4 to H-H ^b	H-H	1	b /33,0	
MP 18 to X-X ^{c,d}	X-X	3	b ₂ /29,5	b ₂ /30,0
		4		
MP 19 to X-X ^c	X-X	3	b /33,0	
		4		
MP 3 to MP 5 ^d	H-H	1	c/29,5	c/30,0
MP 4 to MP 6 ^b	H-H	1	c/33,0	
MP 7 to MP 3	H-H	1	d	
MP 8 to reference plane	Reference plane	1	e	
MP 8 to MP 9	Reference plane	1	f	
MP 13 to V-V	V-V	2	g/26,0	
MP 12 to V-V ^a	V-V	2	g/23,5	
MP 14 to V-V ^d	V-V	2	h/29,5	h/30,0
MP 15 to V-V	V-V	2	h/33,0	
MP 9 to MP 10	Reference plane	1	l _r	
MP 8 to MP 11	Reference plane	1	l _c	
MP 16 to V-V ^b	V-V	2	p/33,0	
MP 17 to V-V ^b	V-V	2	q/33,0	
Angle α (see Figure E.3)				
MP 23 to MP 20	H-H	1	α	
MP 23 to MP 21	V-V	2	α	
MP 23 to MP 22	V-V	2	α	
MP 24 to MP 25	V-V	2	B/33,0	

^a For category HS1, this dimension shall be measured at 25,0 mm distance from the reference plane. For category H19, this dimension shall be measured at 24,5 mm distance from the reference plane.

^b For category HS1, this dimension shall be measured at 31,0 mm distance from the reference plane.

^c For categories H17 and H19, viewing direction ③ is an alternative to viewing direction ④, but values and tolerances shall comply with those defined for viewing direction ④ in UN Regulation 37.

^d For category H19, this dimension shall be measured at 30,5 mm distance from the reference plane.

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Replace the existing Figure E.1 with the following new Figure E.1:

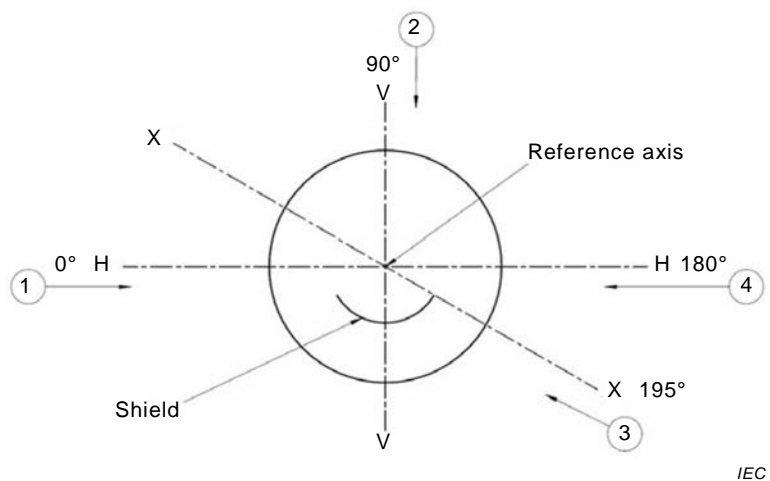


Figure E.1 – Viewing directions, seen from the top of the lamp

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Replace the existing Figure E.2 with the following new Figure E.2:

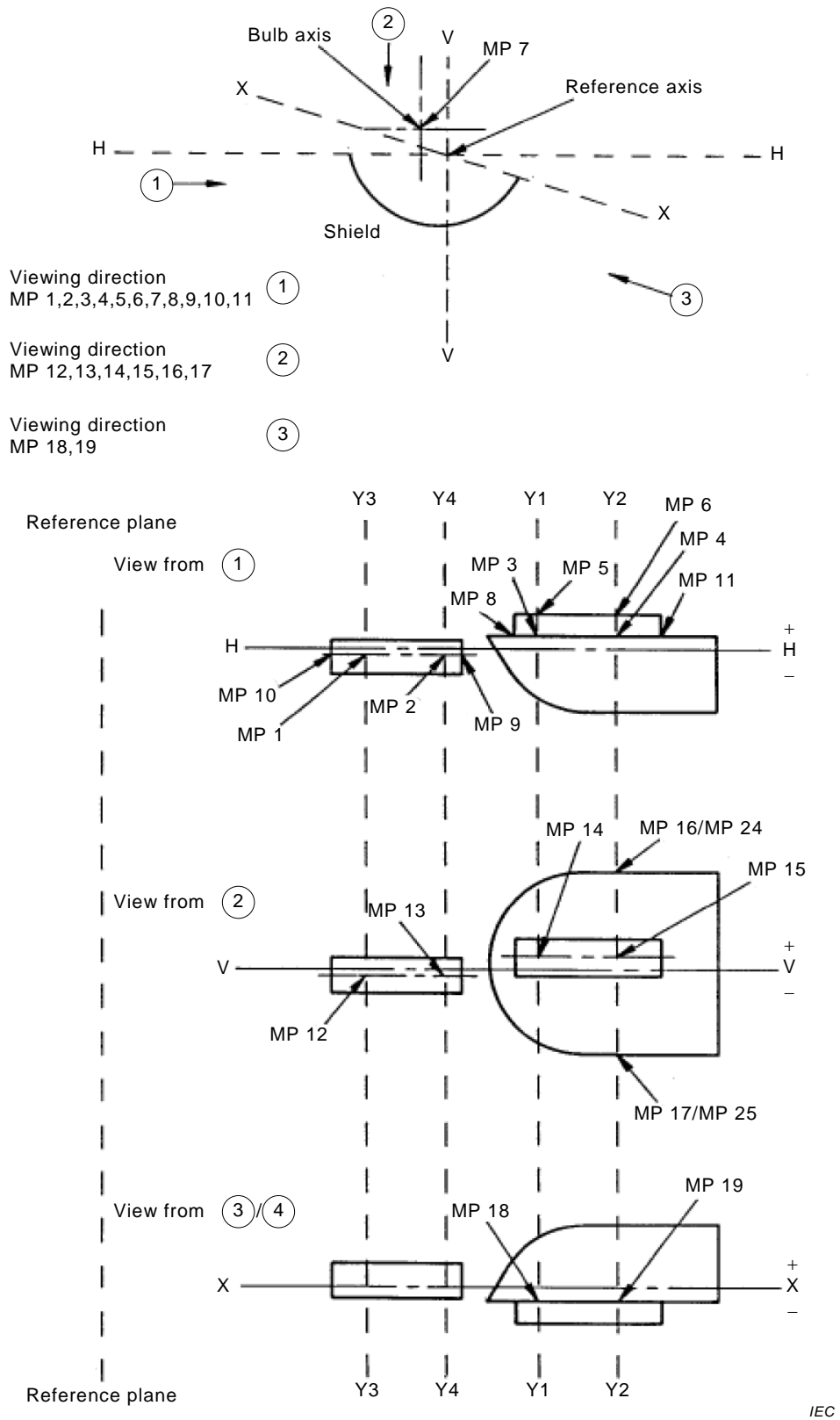


Figure E.2 – Position of measuring points of H4, H17, H19 and HS1 lamps

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Edition 3.0 2017-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 2
AMENDEMENT 2

Lamps for road vehicles – Dimensional, electrical and luminous requirements

Lampes pour véhicules routiers – Exigences dimensionnelles, électriques et lumineuses

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FOREWORD

This amendment has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

The text of this amendment is based on the following documents:

FDIS	Report on voting
34A/2032/FDIS	34A/2038/RVD

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

5.6.2.2 Lamps \leq 2 000 lm

Replace the title of 5.6.2.2 with the following new title

5.6.2.2 Lamps \leq 2 000 lm without black stripes

Add, at the end of 5.6.2.2, the following two new subclauses:

5.6.2.3 Lamps \leq 2 000 lm with black stripes

When measured according to the conditions specified in Annex H, a gas-discharge lamp having a rated luminous flux which does not exceed 2 000 lm but does contain black stripes shall emit at least:

- after 1 s: 700 lm,
- after 4 s: 900 lm.

The rated luminous flux is as indicated on the relevant data sheet.

5.6.2.4 Lamps with more than one rated value, and one of them \leq 2 000 lm

When measured according to the conditions specified in Annex H, a discharge lamp having more than one rated luminous flux and at least one of them does not exceed 2 000 lm shall emit at least:

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- after 1 s: 800 lm,
- after 4 s: 1 000 lm.

The rated luminous flux is as indicated on the relevant data sheet

6.5 Lamp dimensions

Add, at the end of the subclause, the following new text:

The values of light centre lengths of Lx3A, Lx3B, Lx4A, Lx4B, Lx5A and Lx5B¹, are measured as follows.

Measurements shall be made on finished light sources, at an ambient temperature of 23 °C ± 5 °C.

Measurement shall be made at test voltage as specified in the relevant LED light source category sheet.

LED light sources shall first be aged at their test voltage for at least forty-eight hours.

For multi-function LED light sources, each function shall be aged separately.

Before starting a test, the LED light source shall be operated for 30 min at test voltage.

For LED light sources with two functions, both functions shall be operated at the same time during the measurement, unless specified otherwise in the relevant data sheet.

In the case of LR4A and LR4B, the minor function and major function shall also be operated and measured separately, and the light centre length of the minor function shall be 2,5 mm (tolerance of ±0,5 mm under consideration) and the light centre length of the major function shall be 3,0 mm ± 0,3 mm.

In Annex K an example² of a method of measuring the value of the light centre length is given.

8.2 List of specific lamp types

Add below the row for IEC sheet no. 60809-IEC-9620 and UN sheet no. R37-H17 the following three new rows:

-	R37-H18	H18	12	65	PY26d-1
-	R37-H19	H19	12	55 / 60	PU43t-3
-	R37-H20	H20	12	70	PY26d-6

¹ The x represents R, Y and W.

² Any method to determine the value of the light centre length verified to be equivalent to that described in Annex K can be used.

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Add below the row for IEC sheet no. 60809-IEC-9620 and UN sheet no. R99-D8S the following two new rows:

-	R99-D8R	D8R	12	25	PK32d-8
	R99-D9S	D9S	12	27 / 35	PK32d-9

Add the following new rows to the table:

-	R128-L3	LR3A / LR3B	12	3	PGJ18.5d-1
-	R128-L3	LW3A / LW3B	12	4	PGJ18.5d-24
-	R128-L3	LY3A / LY3B	12	4	PGJ18.5d-15
-	R128-LR4	LR4A / LR4B	12	3 / 0,75	PGJ18.5t-5
-	R128-L5	LR5A / LR5B	12	3	PGJ18.5d-10
	R128-L5	LW5A / LW5B	12	6	PGJ18.5d-28
	R128-L5	LY5A / LY5B	12	6	PGJ18.5d-19

C.2.2 Luminous flux

Replace the existing third paragraph with the following new text:

In case of item a), unless otherwise specified, this value shall be not more than 100 % and not less than 80 % of the value measured after 1 min.

Annex I

Replace the existing table with the following new table I.1:

Table I.1 – Overview of lamp types and their applications

Automotive lamps												Bicycle lamps				
Lamps for headlights and/or fog lamps						Lamps for signal lights						LED light sources				
Filament lamps			Discharge lamps			Filaments lamps			Single filament			Data sheet				
Double filament		Single filament		Data sheet		Data sheet		Data sheet		Data sheet		Data sheet				
Cars and trucks	Motorcycles and mopeds	Data sheet	Cars and trucks	Motorcycles and mopeds	Data sheet	Cars and trucks	Motorcycles and mopeds	Data sheet	Cars and trucks	Motorcycles and mopeds	Data sheet	Cars and trucks	Motorcycles and mopeds	Data sheet		
H4	S2	R37-S1/S2	H1	HS2	R37-HS2	D1S	HS2	R37-HS2	P21/4W	R37-P21/4W	WY16W	R37-W16W	LR1	R128-LR1	B1.13W	60809-IEC-9310
H13 / H13A	HS1	R37-HS1	H3			D2S			P21/5W	R37-P21/5W	W21W	R37-W21W	LW2	R128-LW2	B0.6W	60809-IEC-9610
	H17 ^a	R37-H17	H7			D3S			PR21/5W	R37-PR21/5W	H10W/1	R37-H10W	LR3A		B2.4W	60809-IEC-9620
H15		R37-H15	H8 / H8B			D4S			P27/7W	R37-P27/7W	HY10W/1	R37-H10W	LR3B			
H19		R37-H19	H9 / H9B			D1R			PY27/7W	R37-PY27/7W	HY21W	R37-HY21W	LY3A	R128-L3		
			H10			D2R			W15/5W	R37-W15/5W	HY6W	R37-H6W	LY3B			
			H11 / H11B			D3R			W21/5W	R37-W21/5W	P13W	R37-P13W	LW3A			
			H12			D4R			WT21/7W	R37-WT21/7W	P24W	R37-P24W	LW3B			
			H16 / H16B			D5S			WTY21/7W	R37-WTY21/7W	PY24W	R37-P24W	LR4A	R128-LR4		
			PSX26W ^b			D8S			WR21/5W	R37-WR21/5W	PR21W	R37-PR21W	LR4B			
			HB3			D8R					PS19W	R37-P19W	LR5A			
			HB4			D9S					PS24W	R37-P24W	LR5B			
			H27W								PSY19W	R37-P19W	LY5A			
			HIR2								PSY24W	R37-P24W	LY5B			
			PSX24W ^u								C5W	R37-C5W	LW5A			
			H18								H6W	R37-H6W	LW5B			
			H20								H21W	R37-H21W	LW5A			
											P21W	R37-P21W	LW5B			
											PY21W	R37-PY21W				
											P27W	R37-P27W				
											R5W	R37-R5W				
											R10W	R37-R10W				
											T4W	R37-T4W				
											W2.3W	R37-W2.3W				
											W3W	R37-W3W				
											W5W	R37-W5W				
											WY5W	R37-W5W				
											W16W	R37-W16W				

Key
 NOTE 1 Light sources listed under "Cars and trucks" can generally also be used on motorcycles and mopeds.
 NOTE 2 For more detailed usage restrictions see UN R37, UN R99 and UN R128.
^a No use restriction.
^b Typical use for front fog application.

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Add, after Annex J, the following new Annex K:

Annex K (informative)

Method(s) to determine the value of the light centre length³ for Lx3A, Lx3B, Lx4A, Lx4B, Lx5A and Lx5B⁴

K.1 Measurement and calculation method based on ray tracing

A near-field goniophotometer⁵ measurement of the luminance distribution should be performed with an imaging-photometer, in the range $-90^\circ < \gamma < +90^\circ$ and $0^\circ < C < 180^\circ$, with an angular resolution of 1° or smaller for both C and γ (see Figures K.1 and K.2).

From this measurement data, a software tool, simulating the luminance distribution of the measurement, should generate a set of at least one million light rays originating from the light emitting area.

From an arbitrary point in space, the squared distance to each individual light ray of this set of light rays should be calculated. The light centre length should be calculated as the distance from the reference plane to the point, where the sum of all squared distances is at a minimum.

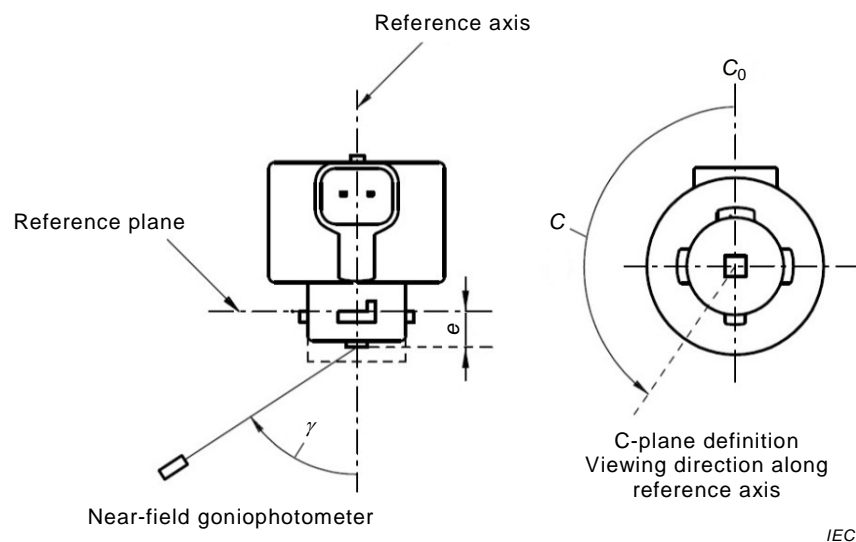


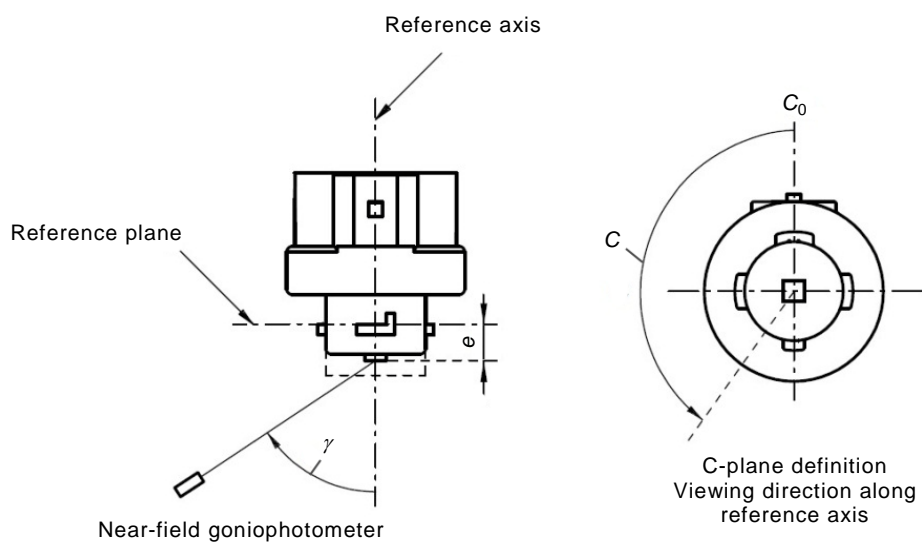
Figure K.1 – Set-up to measure the luminance distribution of the A versions of the LED light sources

³ The light centre length corresponds to the parameter e in the corresponding data sheets of UN Regulation No. 128.

⁴ x represents R, Y and W.

⁵ CIE Publication 070-1987: The Measurement of Absolute Luminous Intensity Distributions.

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Figure K.2 – Set-up to measure the luminance distribution of the B versions of the LED light sources

K.2 Alternative method

Under consideration.

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Add the following Bibliography

Bibliography

CIE Publication 070-1987, *The Measurement of Absolute Luminous Intensity Distributions*

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