

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Lamps for road vehicles – Dimensional, electrical and luminous requirements

Lampes pour véhicules routiers – Exigences dimensionnelles, électriques et lumineuses

Withhold



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INTERNATIONAL STANDARD

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Lampes pour véhicules routiers – Exigences dimensionnelles, électriques et lumineuses

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LAMPS FOR ROAD VEHICLES – DIMENSIONAL, ELECTRICAL AND LUMINOUS REQUIREMENTS

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International Standard IEC 60809 has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34, Lamps and related equipment.

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

FDIS	Report on voting
34A/1798/FDIS	34A/1819/RVD

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

This third edition cancels and replaces the second edition (1995), its Amendment 1 (1996), its Amendment 2 (2002), its Amendment 3 (2004), its Amendment 4 (2009) and its Amendment 5 (2012). This edition constitutes a technical revision.

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

- a) the introduction of requirements for non-replaceable filament lamps;
- b) the introduction of requirements for LED light sources.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2. However, as the original editable data sheets and some figures from previous editions were not available, they have been reproduced in their old format which does not comply fully with the current drafting rules.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site 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- withdrawn,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.

Withdrawn

LAMPS FOR ROAD VEHICLES – DIMENSIONAL, ELECTRICAL AND LUMINOUS REQUIREMENTS

1 Scope

This International Standard is applicable to replaceable and standardised lamps (filament lamps, discharge lamps and LED light sources) to be used in headlamps, fog-lamps and signalling lamps for road vehicles. In some applications, these lamps may be installed as non-replaceable.

This standard is especially applicable to those lamps which are the subject of legislation. In particular, it includes the lamps contained in Regulations No. 37, No. 99, No. 128 and its series of amendments of the Geneva Agreement of 20 March 1958 of the United Nations Economic Commission for Europe (UNECE). However, the standard may be used for other lamps falling under the scope of this standard, as well as lamps which are subject of legislation but not contained in Regulations No. 37, No. 99 and No. 128, e.g. the non-replaceable (filament) lamps and LED modules.

For replaceable and standardised lamps, the standard specifies the technical requirements with methods of tests and basic interchangeability (dimensional, electrical and luminous) for lamps of normal production and for standard (étalon) lamps.

For most of the requirements given in this standard, reference is made to the “relevant lamp data sheet”. For all lamps listed in Clause 8, data sheets are contained in this standard or included by reference. For other lamps, the relevant data are supplied by the lamp manufacturer or responsible vendor. It could be based on national legislation.

Other requirements to replaceable and standardised lamps such as lamp life, luminous flux maintenance, torsion strength and resistance to vibration and shock are specified in IEC 60810. Such requirements to non-replaceable lamps are given in this standard.

For some test methods, reference is made to IEC 60810.

Road vehicle lamps for supplementary purposes which are not the subject of legislation are specified in IEC 60983.

In countries which legislate for approval, for example under the terms of the aforementioned UN Regulations, it is suggested that reference is made to this standard for assessment of compliance. IEC 60810 and IEC 60983 are not intended for that purpose.

NOTE 1 In various vocabularies and standards, different terms are used for “incandescent lamp”, “discharge lamp” and “LED lamp”. In this standard “filament lamp”, “discharge lamp” and “LED light source” are used. However, where only “lamp” is written all three kinds of lamp are meant, unless the context clearly shows that it applies to one kind only.

NOTE 2 Wherever the term “device” is used, it is meant to designate equipment which is used as luminaire. It can take the form and purpose of a headlight or signal light.

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.

IEC 60050 (all parts), *International Electrotechnical Vocabulary* (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*

IEC 60810:2014, *Lamps for road vehicles – Performance requirements*

IEC 60983, *Miniature lamps*

IEC 62504, *General lighting – Light emitting diode (LED) products and related equipment – Terms and definitions*

CIE 15:2004, *Colorimetry*

United Nations, *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*¹

Available from Internet: www.unece.org/trans/main/wp29/wp29regs.html (website checked 2014-08-12)

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*

Addendum 5: Regulation No. 6, *Uniform provisions concerning the approval of direction indicators for power-driven vehicles and their trailers*

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*

Addendum 22: Regulation No. 23, *Uniform provisions concerning the approval of reversing and manoeuvring lamps for power-driven vehicles and their trailers*

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*

Addendum 37: Regulation No. 38, *Uniform provisions concerning the approval of rear fog lamps for power-driven vehicles and their trailers*

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*

Addendum 76: Regulation No. 77, *Uniform provisions concerning the approval of parking lamps for power-driven vehicles*

¹ Also known as *The 1958 Agreement*. In the text of this standard the regulations under this agreement are referred to as, for example, UN Regulation 37 or R 37.

Addendum 86: Regulation No. 87, *Uniform provisions concerning the approval of daytime running lamps for power-driven vehicles*

Addendum 90: Regulation No. 91, *Uniform provisions concerning the approval of side-marker lamps for motor vehicles and their trailers*

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*

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 M₁ and N₁ vehicles powered by an electric power train only with regard to the measurement of electric energy consumption and electric range*

Addendum 118: Regulation No. 119, *Uniform provisions concerning the approval of cornering lamps for power-driven vehicles*

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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-845, IEC 60810, IEC 62504, R 37, R 99 and R 128 as well as the following apply.

3.1

category

term used to describe different basic designs of standardized lamps

Note 1 to entry: Each specific designation, for example P21/5W, H4, D2R forms a category. Most of these designations are taken from the UN Regulations.

3.2

type

lamps which are distinguished by common features relevant to the test applied

Note 1 to entry: Lamps bearing the same trade name or mark but produced by different manufacturers are considered as being of different types. Lamps produced by the same manufacturer differing only by the trade name or mark may be considered to be of the same type.

Note 2 to entry: Lamps with different bulb designs, insofar as it affects the optical results, are considered to be of different types.

Note 3 to entry: For filament lamps, lamps of different nominal voltages are considered to be of different types.

Note 4 to entry: A selective-yellow bulb or a selective-yellow additional outer bulb, solely intended to change the colour but not the other characteristics of a light source emitting white light, does not constitute a change of type of the light source.

3.3

type test

test or series of tests, made on a type test sample, for the purpose of checking compliance of the design of a given product with the requirements of the relevant specification

3.4

type test sample

sample consisting of one or more similar units, submitted by the manufacturer or responsible vendor for the purpose of a type test

3.5

conformity of production

compliance of the series production of a given type with the requirements of the relevant specification

Note 1 to entry: Production lamps are of the same design as the approved type test sample.

Note 2 to entry: Local regulations may provide for checking conformity of production by a government agency.

3.6

nominal voltage

voltage used to designate a lamp, usually being the battery voltage (6 V, 12 V or 24 V) of the road vehicle supply network

Note 1 to entry: The term used in the UN regulations is "rated voltage".

3.7

nominal wattage

wattage used to designate a lamp

3.8

test voltage

voltage at the cap terminals for filament lamps and at the input terminals of the ballast for discharge lamps for which some characteristics are specified and at which they shall be tested

3.9

rated value

value of a characteristic specified for operation of a lamp at test voltage and/or other specified conditions

Note 1 to entry: The term used in the UN regulations is "objective value".

3.10

tolerance

allowable variation from a rated value generally expressed as percentage of the rated value

3.11

limit values

lowest and/or highest values for characteristics to which the lamp has to comply when operated under specified conditions

3.12

test luminous flux

specified luminous flux of a standard (étalon) lamp at which the photometric characteristics of lighting and light-signalling devices shall be measured and which has to be adjusted for testing a lamp in the standard headlamp according to 4.8

3.13

reference plane

plane defined with reference to the cap or base and with respect to which positions of certain parts of the lamp are measured

3.14**reference axis**

axis defined with reference to the cap or base and with respect to which the positions of certain parts of the lamp are measured

3.15**ageing period**

period during which unused lamps are operated at their test voltage in order to stabilize their performance

3.16**standard lamp****étalon lamp**

lamp emitting white or amber or red light with reduced dimensional tolerances, used for the photometric testing of lighting and light-signalling devices

Note 1 to entry: Standard lamps are specified for only one nominal voltage for each category.

3.17**production lamp**

lamp which shall comply with the requirements of this standard as indicated in the column "production lamps" on the relevant lamp data sheet

Note 1 to entry: The term used in the UN regulations is "lamp of normal production".

3.18**heavy duty lamp**

lamp declared as such by the manufacturer or responsible vendor which shall comply with the heavy duty test conditions specified in Table B.3 of IEC 60810:2014 in addition to the requirements specified in this standard

3.19**main beam**

driving beam

high beam

headlight designed to illuminate for a considerable distance ahead of the vehicle carrying it

Note 1 to entry: The term used in the UN regulations is "driving beam".

3.20**dipped beam**

passing beam

low beam

headlight designed to illuminate without causing undue glare to people in front of the vehicle carrying it, particularly to the drivers of approaching vehicles

Note 1 to entry: The term used in the UN regulations is "passing beam".

3.21**non-replaceable filament lamp**

filament lamp which cannot be removed from the device or luminaire

Note 1 to entry: Non-replaceable filament lamps are usually intended as components for integration into the luminaire or device by manufacturers. They are designed and intended to be indivisible parts of a lighting or light signalling device, or of parts or modules or units of such devices.

3.22**life B10**

constant of the Weibull distribution indicating the time during which 10 % of a number of the tested lamps of the same type have reached the end of their individual lives

3.23

luminous flux maintenance

ratio of the luminous flux of a lamp at a given time in its life to its initial luminous flux, the lamp being operated under specific conditions

Example 1 L_{70} is the time in h to 70 % luminous flux maintenance.

Example 2 L_{50} is the time in h to 50 % luminous flux maintenance.

3.24

initial luminous flux

luminous flux of a lamp measured after the ageing specified in Clause C.1 for filament lamps or in Annex D of IEC 60810:2014 for discharge lamps or in Clause C.2 for LED light sources

4 Requirements and test conditions for filament lamps

4.1 General requirements

Filament lamps shall be so designed as to be and to remain in good working order when in normal use. They shall, moreover, exhibit no fault in design or manufacture.

4.2 Lamp marking

The following information shall be legibly and durably marked on all filament lamps, except for non-replaceable filament lamps:

- the trade name or mark of the manufacturer or responsible vendor;
- the nominal voltage;
- the international designation of the relevant category;
- the nominal wattage (in the sequence: high wattage filament/low wattage filament for dual filament lamps); this need not be indicated separately if it is part of the international designation of the relevant filament lamp category.

Additionally, halogen filament lamps meeting the requirements of 4.9 shall be marked with a “U”.

NOTE 1 Halogen filament lamps are filament lamps whose category designation usually starts with the letter “H”. Some halogen lamps complying with the requirements in 4.9 have a category designation starting with another letter.

Inscriptions other than the above may be affixed.

NOTE 2 An example of such an inscription is the approval mark conferred by an administrative authority.

Compliance shall be checked by the following:

- a) presence and legibility – by visual inspection;
- b) durability – by applying the following test on unused lamps:

The area of the marking on the lamp shall be rubbed by hand with a smooth cloth, dampened with water, for a period of 15 s.

After this test the marking shall still be legible.

If the marking is on the bulb, it shall not adversely affect the luminous characteristics.

4.3 Bulbs

Filament lamp bulbs shall exhibit no scores or spots which might impair their optical performance.

4.4 Colour

4.4.1 Colour of light

The colour of the light emitted by the filament lamp shall be white, unless otherwise prescribed on the relevant filament lamp data sheet. For some categories, other colour(s) of light are allowed.

The colorimetric characteristics of the light emitted, expressed in CIE x, y chromaticity co-ordinates, shall lie within the following limits:

- finished filament lamps emitting white light:

W ₁₂	green boundary:	$y = 0,150 + 0,640 x$
W ₂₃	yellowish green boundary:	$y = 0,440$
W ₃₄	yellow boundary:	$x = 0,500$
W ₄₅	reddish purple boundary:	$y = 0,382$
W ₅₆	purple boundary:	$y = 0,050 + 0,750 x$
W ₆₁	blue boundary:	$x = 0,310$

with intersection points:

W ₁ :	$x = 0,310, y = 0,348$
W ₂ :	$x = 0,453, y = 0,440$
W ₃ :	$x = 0,500, y = 0,440$
W ₄ :	$x = 0,500, y = 0,382$
W ₅ :	$x = 0,443, y = 0,382$
W ₆ :	$x = 0,310, y = 0,283$

- finished filament lamps emitting selective-yellow light:

SY ₁₂	green boundary:	$y = 1,290 x - 0,100$
SY ₂₃	the spectral locus ²	
SY ₃₄	red boundary:	$y = 0,138 + 0,580 x$
SY ₄₅	yellowish white boundary:	$y = 0,440$
SY ₅₁	white boundary:	$y = 0,940 - x$

with intersection points:

SY ₁ :	$x = 0,454, y = 0,486$
SY ₂ :	$x = 0,480, y = 0,519$
SY ₃ :	$x = 0,545, y = 0,454$
SY ₄ :	$x = 0,521, y = 0,440$
SY ₅ :	$x = 0,500, y = 0,440$

- finished filament lamps emitting red light:

R ₁₂	yellow boundary:	$y = 0,335$
R ₂₃	the spectral locus	
R ₃₄	the purple line:	(its linear extension across the purple range of colours between the red and the blue extremities of the spectral locus).
R ₄₁	purple boundary:	$y = 0,980 - x$

with intersection points:

² See CIE 15.

R ₁ :	x = 0,645, y = 0,335
R ₂ :	x = 0,665, y = 0,335
R ₃ :	x = 0,735, y = 0,265
R ₄ :	x = 0,721, y = 0,259

The colour of the light emitted shall be measured by the method specified in Annex B.

Each measured value shall lie within the required tolerance area. Moreover, in the case of filament lamps emitting white light, the measured values shall not deviate more than 0,020 units in the x and/or y direction from a point of choice on the Planckian locus³.

For conformity of production purposes of amber and red colour only, at least 80 % of the measuring results shall lie within the required tolerance area.

4.4.2 Colour endurance

Filament lamps, but for conformity of production purposes only colour coated lamps, for use in light signalling devices shall be operated under test conditions for colour endurance measurements as specified in Annex J.

Thereafter the colour of the light shall be measured by the method specified in Annex B, and all measuring results, but for amber and red colour at least 80 % of the measuring results for conformity of production purposes, shall be within the limits specified in 4.4.1.

In case of colour filter coatings, no cracks in these coatings shall be visible without specific optical tools.

Test samples that have been operated under conditions as specified in Annex J shall no longer be used in light signalling devices and are to be considered end of life for that purpose.

4.4.3 Coated bulb

In the case of a coated bulb, after the ageing period corresponding to C.1.1, the surface of the bulb shall be lightly wiped with a cotton cloth soaked in a mixture of 70 % by volume of n-heptane and 30 % by volume of toluol. After about 5 min, the surface shall be inspected visually. It shall not show any apparent changes.

4.5 Lamp dimensions

The filament lamp dimensions shall comply with the limiting values given in the lamp drawing or on the relevant filament lamp data sheet.

The definition of and the measuring condition for the filament shape, length and position, shall be in accordance with the appropriate requirements of Annexes A, D, E and F respectively; this does not apply to non-replaceable filament lamps.

4.6 Caps and bases

Filament lamps shall have standard caps or bases as specified on the relevant filament lamp data sheet and shall comply with the relevant cap data sheet of IEC 60061-1. This requirement does not apply to non-replaceable filament lamps; in this case, filament lamps shall be equipped with bases that allow firm and secure fixation to the lighting or light signalling devices, or to parts/modules/units of such devices, for which these filament lamps are designed and intended.

³ See CIE 15.

4.7 Initial electrical and luminous requirements

Filament lamp wattage and luminous flux shall comply with the limiting values given on the relevant lamp data sheet.

The luminous flux specified on the relevant filament lamp data sheet applies for filament lamps emitting white light, unless a special colour is stated there.

In the case where selective-yellow colour is allowed the luminous flux of the filament lamp with selective-yellow (outer) bulb shall be at least 85 % of the specified luminous flux of the relevant filament lamps with colourless bulb.

Compliance shall be checked by the tests specified in Clause C.1.

4.8 Check on optical quality

4.8.1 General

This requirement applies only to double filament lamps with internal shield for headlamps emitting an asymmetrical dipped beam when the relevant regulation requires such a test.

The check on optical quality shall be carried out at a voltage such that the test luminous flux is obtained.

4.8.2 12 V lamps emitting white light

The sample which most nearly conforms to the requirements laid down for the standard filament lamp shall be tested in an appropriate standard headlamp and it shall be verified that the assembly comprising the aforesaid headlamp and the filament lamp being tested meets the light-distribution requirements laid down for the dipped beam in the relevant regulation, directive or standard.

4.8.3 6 V and 24 V lamps emitting white light

The sample which most nearly conforms to the rated dimension values shall be tested in an appropriate standard headlamp and it shall be verified that the assembly comprising the aforesaid headlamp and the filament lamp being tested meets the light-distribution requirements laid down for the dipped beam in the relevant regulation, directive or standard. Deviations not exceeding 10 % of the minimum values will be acceptable.

4.8.4 Lamps emitting selective-yellow light

Filament lamps emitting selective-yellow light shall be tested in the same manner as described in 4.8.1 and 4.8.2 in an appropriate standard headlamp to ensure that the illuminance complies with at least 85 % for 12 V filament lamps, and at least 77 % for 6 V and 24 V filament lamps, with the minimum values of the light-distribution requirements laid down for the dipped beam in the relevant regulation, directive or standard. The maximum illuminance limits remain unchanged.

In the case of a filament lamp having a selective-yellow bulb, the test shall be left out if the approval is also given to the same type of filament lamp emitting white light.

4.9 UV radiation

The UV radiation of a halogen filament lamp shall be such that:

$$k_1 \leq 2 \times 10^{-4} \text{ W/lm}, \text{ and } k_2 \leq 2 \times 10^{-6} \text{ W/lm},$$

k_1 and k_2 are calculated according to:

$$k_1 = \frac{\int_{315}^{400} \Phi_{\lambda} d\lambda}{k_m \cdot \int_{380}^{315} \Phi_{\lambda} V(\lambda) d\lambda} \quad \text{and} \quad k_2 = \frac{\int_{250}^{315} \Phi_{\lambda} d\lambda}{k_m \cdot \int_{380}^{250} \Phi_{\lambda} V(\lambda) d\lambda}$$

where

k_m 683 lm/W;

Φ_{λ} is the spectral power of the radiant flux expressed in watts per nanometre (W/nm);

$V(\lambda)$ is the CIE luminosity function;

λ is the wavelength expressed in nanometres (nm).

These values shall be calculated using intervals of five nanometres.

In the case of non-replaceable filament lamps, compliance to UV radiation requirements may be exempted if this is specified in the relevant lamp data sheet.

4.10 Standard (étalon) filament lamps

Standard filament lamps shall fulfil the additional requirements as specified on the relevant filament lamp data sheets.

Bulbs of standard (étalon) filament lamps emitting white light shall not alter the CIE chromaticity co-ordinates of a luminous source having a colour temperature of 2 856 K by more than 0,010 units in the x and/or y direction. For standard (étalon) filament lamps emitting amber or red light, changes of the bulb temperature shall not affect the luminous flux, which might impair photometric measurements of signalling devices. Moreover, for amber standard (étalon) filament lamps, the colour shall be in the lower part of the tolerance area, i.e. towards the red.

4.11 Non-replaceable filament lamps

4.11.1 General

For non-replaceable filament lamps (either as part of a lighting or light signalling device (luminaire), or as part of parts/modules/units of such devices), compliance shall be demonstrated, with a test report or other means, with requirements to:

- lifetime;
- colour and colour endurance;
- luminous flux maintenance and colour maintenance;
- vibration and shock resistance

as specified below.

A brief technical description (data sheet) of the non-replaceable filament lamp shall be submitted by the manufacturer or responsible vendor, stating in particular:

- the part number or other identification means;
- the test voltage;
- the device (luminaire) the filament lamp is used for;
- whether “standard” or “heavy duty” test conditions apply for testing vibration and shock resistance.

For testing purposes, 20 type test samples shall be used for performing the testing of non-replaceable filament lamps.

For conformity of production of non-replaceable filament lamps, compliance shall be checked with the requirements to lifetime in 4.11.3 and for colour coated filament lamps also with requirements to colour endurance as specified in 4.11.4.

For conformity of production test purposes, 20 test samples per year of normal production shall be used. In the case of colour coated non-replaceable filament lamps and the colour endurance requirement, a representative distribution over different lamps may be used provided that these are using the same colour coating technology and finishing, and that this representative distribution comprises lamps of the smallest and the largest diameter of the outer bulb, each at the highest rated wattage.

Alternatively to testing compliance, (previous) measurements or test reports of test samples may be used, under the condition that:

- the essential parameters of these test samples are identical in relation to the test under consideration;
- simulations may be used additionally, in case essential parameters of these test samples are not identical but similar in relation to the test under consideration.

4.11.2 Fixation

For testing purposes, non-replaceable filament lamps shall be used that are fixed firmly and securely to appropriate means necessary to conduct the test or as specified by the respective test. They do not need to be installed in the devices for which they are designed and intended, but may be fixed to parts/modules/units of the devices for which they have been designed and intended.

4.11.3 Lifetime

The life B10 of non-replaceable filament lamps shall not be less than the value given in Table 1, and not less than 50 % of that value, in the case of non-replaceable filament lamps that are an indivisible part of parts/modules/units of lighting or light signalling devices.

Table 1 – Lifetime of non-replaceable filament lamps

Devices (luminaires) in which non-replaceable filament lamp(s) are used	Life B10 * h	Corresponding UN Regulations (for information only)
Rear registration plate lamps	2 200**	No. 4
Direction indicator lamps	500	No. 6, 50
Front and rear position lamps	2 200**	No. 7, 50
Stop-lamps	1 000	No. 7, 50
End-outline marker lamps	2 200	No. 7
Reversing lamps	100	No. 23
Rear fog lamps	100	No. 38
Parking lamps	2 200	No. 77
Daytime running lamps	4 000	No. 87
Side marker lamps	2 200**	No. 91
Cornering lamps	200	No. 119
* Typical "on"- times for different functions per 200 000 km drive distance with an average speed of 33,6 km/h, based on the composition of driving cycles defined in R101.		
** In case these lamps are intended for vehicles where the devices in which they are used are also switched ON together with daytime running lamps (DRL), the value of 6 200 h shall be used.		

Compliance is checked by life tests as prescribed in Annex A of IEC 60810:2014

In the case of dual non-replaceable filament lamps, the applicable filament shall be considered that is used for the specified device.

4.11.4 Colour endurance

Non-replaceable filament lamps shall comply with the colour endurance requirements as specified in 4.4.

4.11.5 Luminous flux and colour maintenance

The luminous flux maintenance shall not be less than 70 % at life B10.

In the case of amber and red coloured non-replaceable filament lamps, the colour of the light emitted by these filament lamps shall be measured at the moment of luminous flux maintenance and be within the colour boundaries as defined in 4.4.1. These measurements shall be made at test voltage as indicated in the relevant datasheet and at an ambient temperature of $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ using a suitable integrating photometer.

In the case of dual non-replaceable filament lamps, the applicable filament shall be considered that is used for the specified device.

Testing may be combined with the lifetime test.

4.11.6 Vibration and shock resistance

To assess the performance influenced by vibration or shock, the test methods and schedules detailed in Annex B of IEC 60810:2014 shall be used.

The non-replaceable filament lamps are deemed to have satisfactorily completed the wideband or narrowband random vibration test as described in Annex B of IEC 60810:2014 if they continue to function during and after the test.

The number of non-replaceable filament lamps failing one of the tests shall not be more than 2.

5 Requirements and test conditions for discharge lamps

5.1 General requirements

Discharge lamps shall be so designed as to be and to remain in good working order when in normal use. They shall, moreover, exhibit no fault in design or manufacture.

5.2 Lamp marking

The following information shall be legibly and durably marked on the cap of the discharge lamps:

- the trade name or mark of manufacturer or responsible vendor;
- the nominal wattage;
- the international designation of the relevant category.

Inscriptions other than the above may be affixed.

NOTE 1 An example of such inscription is the approval mark conferred by an administrative authority.

NOTE 2 The ballast used for starting and operating the discharge lamps is marked with type and trade mark identification and with the nominal voltage and wattage, as indicated on the relevant data sheet.

Compliance shall be checked by the following:

- a) presence and legibility – by visual inspection;
- b) durability – by applying the following test on unused lamps:

The area of the marking on the lamp shall be rubbed by hand with a smooth cloth, dampened with water, for a period of 15 s.

After the test the marking shall still be legible.

5.3 Bulbs

The bulb of the discharge lamps shall exhibit no scores or spots which might impair their optical performance.

The bulb shall comply with the dimensional specifications given on the relevant data sheet.

In the case of a coloured (outer) bulb after an operating period of 15 h with the ballast at test voltage, the surface of the bulb shall be lightly wiped with a cotton cloth of 70 % by volume of n-heptane and 30 % by volume of toluol. After 5 min, the surface shall be inspected visually. It shall not show any apparent changes.

5.4 Caps

Discharge lamps shall be equipped with standard caps complying with the cap data sheets of IEC 60061-1 as specified on the relevant data sheet. The cap shall be strong and firmly secured to the bulb.

5.5 Position and dimensions of electrodes, arc and black stripes

5.5.1 Measurements

An example of a method of measuring arc and electrode position is given in Annex G. Any method with equivalent measurement accuracy may be used.

5.5.2 Electrodes

The geometric position and dimensions of the electrodes shall be as specified on the relevant data sheet.

Compliance shall be checked before the ageing period, the discharge lamp unlit and using optical methods through the glass envelope.

5.5.3 Arc

The shape and the displacement of the arc shall conform to the requirements as given on the relevant data sheet.

Compliance shall be checked after ageing with the lamp supplied by the ballast at test voltage.

5.5.4 Black stripes

The position, dimensions and transmission of the black stripes (if any) shall comply with the requirements as given on the relevant data sheet.

Compliance shall be checked after ageing, with the lamp supplied by the ballast at test voltage.

5.6 Starting, run-up and hot-restrike characteristics

5.6.1 Starting

The discharge lamp shall start directly and remain alight.

5.6.2 Run-up

5.6.2.1 Lamps > 2 000 lm

When measured according to the conditions specified in Annex H, a discharge lamp having a rated luminous flux which exceeds 2 000 lm shall emit at least:

- After 1 s: 25 % of its rated luminous flux.
- After 4 s: 80 % of its rated luminous flux.

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

5.6.2.2 Lamps ≤ 2 000 lm

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

- After 1 s: 800 lm.
- After 4 s: 1 000 lm.

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

5.6.3 Hot-restrike

After being switched-off for a period as indicated on the relevant data sheet, when switched-on, the lamp shall restart directly.

After 1 s the lamp shall emit at least 80 % of its rated luminous flux.

5.6.4 Compliance

Compliance shall be checked by the tests specified in Annex H.

5.7 Electrical and photometric characteristics

5.7.1 Voltage and wattage

The voltage and wattage of the lamp shall be within the limits given on the relevant data sheet.

5.7.2 Luminous flux

The luminous flux shall be within the limits given on the relevant data sheet. In the case where white and yellow is specified for the same type, the rated value applies to the lamp emitting white light, whereas the luminous flux of the lamp emitting yellow light shall be at least 68 % of the specified value.

5.7.3 Compliance

Compliance shall be checked by the tests specified in Annex H.

5.8 Colour

The colour of the light emitted shall be white unless yellow is prescribed on the relevant data sheet.

In case of white the colorimetric characteristics, expressed in CIE chromaticity co-ordinates, shall lie within the limits given on the relevant data sheet.

In case of yellow, the chromaticity coordinates (x,y) of the light emitted shall lie inside the chromaticity areas defined by the boundaries:

SY ₁₂	green boundary:	$y = 1,290 x - 0,100$
SY ₂₃	the spectral locus ⁴	
SY ₃₄	red boundary:	$y = 0,138 + 0,580 x$
SY ₄₅	yellowish white boundary:	$y = 0,440$
SY ₅₁	white boundary:	$y = 0,940 - x$

with intersection points:

SY ₁ :	$x = 0,454, y = 0,486$
SY ₂ :	$x = 0,480, y = 0,519$
SY ₃ :	$x = 0,545, y = 0,454$
SY ₄ :	$x = 0,521, y = 0,440$
SY ₅ :	$x = 0,500, y = 0,440$

⁴ See CIE 15.

The minimum red content of the light of a discharge lamp emitting white light shall be such that

$$k_{\text{red}} \geq 0,05.$$

k_{red} is calculated according to:

$$k_{\text{red}} = \frac{\int_{610}^{780} \Phi_{\lambda} V(\lambda) d\lambda}{\int_{380}^{780} \Phi_{\lambda} V(\lambda) d\lambda}$$

where Φ_{λ} , $V(\lambda)$ and λ are as defined in 4.9.

This value shall be calculated using intervals of one nanometre.

Compliance is checked by the tests specified in Annex H.

5.9 UV radiation

The maximum UV content of the light of a discharge lamp shall be such that

$$k_{\text{UV}} \leq 10^{-5} \text{ W/lm.}$$

k_{UV} is calculated according to:

$$k_{\text{UV}} = \frac{\int_{250}^{400} \Phi_{\lambda} S(\lambda) d\lambda}{k_m \cdot \int_{380}^{780} \Phi_{\lambda} V(\lambda) d\lambda}$$

where k_m , Φ_{λ} , $V(\lambda)$ and λ are as defined in 4.9 and $S(\lambda)$ is the spectral weighting function according to Table 2.

This value shall be calculated using intervals of one nanometre.

Table 2 – Spectral weighting function

λ	$S(\lambda)$	λ	$S(\lambda)$	λ	$S(\lambda)$
250	0,430	305	0,060	355	0,000 16
255	0,520	310	0,015	360	0,000 13
260	0,650	315	0,003	365	0,000 11
265	0,810	320	0,001 0	370	0,000 09
270	1,000	325	0,000 50	375	0,000 077
275	0,960	330	0,000 41	380	0,000 064
280	0,880	335	0,000 34	385	0,000 053
285	0,770	340	0,000 28	390	0,000 044
290	0,640	345	0,000 24	395	0,000 036
295	0,540	350	0,000 20	400	0,000 030
300	0,300				

Wavelengths chosen are representative, other values shall be interpolated.

Compliance shall be checked by the tests specified in Annex H.

5.10 Standard (étalon) discharge lamps

Standard discharge lamps shall comply with the requirements applicable to production lamps and to the specific requirements as stated in the relevant data sheet. In case of a type emitting white and yellow light, the standard lamp shall emit white light.

6 Requirements and test conditions for LED light sources

6.1 General requirements

LED light sources shall be so designed as to be and to remain in good working order when in normal use. They shall, moreover, exhibit no fault in design or manufacture.

6.2 Light source marking

The following information shall be legibly and durably marked on all LED light sources:

- the trade name or mark of the manufacturer or responsible vendor;
- the nominal voltage or voltage range;
- the international designation of the relevant category.

Inscriptions other than the above may be affixed.

NOTE An example of such an inscription is the approval mark conferred by an administrative authority.

Compliance shall be checked by the following:

- a) presence and legibility – by visual inspection;
- b) durability – by applying the following test on unused light source:

The area of the marking on the lamp shall be rubbed by hand with a smooth cloth, dampened with water, for a period of 15 s.

After this test, the marking shall still be legible.

6.3 Optical surfaces

LED light sources shall exhibit no scores or spots on their optical surfaces which might impair their efficiency and their optical performance.

6.4 Colour of light

The colour of the light emitted by the LED light source shall be white, unless otherwise prescribed on the relevant filament lamp data sheet. For some categories, other colour(s) of light are allowed.

The colorimetric characteristics of the light emitted, expressed in CIE chromaticity co-ordinates, shall lie within the limits as specified in 4.4.1.

6.5 Lamp dimensions

The LED light source dimensions shall comply with the limiting values given in the lamp drawing or on the relevant data sheet.

6.6 Caps and bases

Replaceable LED light sources shall have standard caps or bases as specified on the relevant data sheet and shall comply with the relevant cap data sheet of IEC 60061-1.

The cap shall be strongly and firmly secured to the rest of the LED light source. To ascertain whether LED light sources conform to the requirements above, a visual inspection, a dimension check and, where necessary, a trial fitting into the holder as specified in IEC publication 60061 shall be carried out.

6.7 Initial electrical and photometrical requirements

LED light source wattage, luminous flux and intensity distribution (e.g. normalized luminous intensity distribution, cumulative luminous flux) shall comply with the limiting values given on the relevant data sheet.

The colorimetric characteristics of the light emitted, expressed in CIE chromaticity coordinates, shall lie within the limits as specified in 4.4.1.

Compliance shall be checked by the tests specified in Clause C.2.

6.8 Red content

For LED light sources emitting white light, the minimum red content of the light shall be such that

$$k_{\text{red}} \geq 0,05 \text{ (see 5.8).}$$

6.9 UV radiation

The UV radiation of the LED light source shall be determined according to 5.9.

If $k_{\text{UV}} \leq 10^{-5} \text{ W/lm}$, the light source is of the low-UV type.

6.10 Standard (étalon) light sources

Standard LED light sources shall fulfil the additional requirements as specified on the relevant data sheets.

7 Sampling and conditions of compliance

Requirements for sampling and conditions of compliance, except for non-replaceable filament lamps, are specified in the relevant regulation, for example UN Regulations No. 37, No. 99 and No. 128.

Requirements for sampling and conditions of compliance for non-replaceable filament lamps, are specified in the relevant regulation for devices, using non-replaceable filament lamps.

NOTE At date of publication these are specified in UN Regulations Nos. 4, 6, 7, 23, 38, 50, 77, 87, 91 and 119.

8 Lamp data sheets

8.1 General

Data sheets are numbered so that:

- The first part of the lamp data sheet number represents the number of this standard (60809) followed by the letters “IEC”.
- The second part represents the lamp data sheet number.
- The third part on the sheet indicates the edition of the sheet.

In the case that a reference is made from this standard to the lamp data sheet in UN regulation:

- The first part of the reference represents the number of the UN Regulation (R37, R99 or R128).
- The second part represents the name of the lamp data sheet in the UN.

Many data sheets in this document have been copied from previous editions of the standard, pre-dating the general change to IEC standard numbers. In these data sheets the sheet number and reference number to the cap standard still refer to the old numbering. For data sheets dated before 2014, read the sheet reference as 60809-IEC-xxxx instead of 809-IEC-xxxx, and read references to IEC 61-1 as IEC 60061-1.

8.2 List of specific lamp types

IEC sheet no. ⁵	UN sheet no. ⁶	Category	Voltage V	Wattage W	Cap
60809-IEC-2110-	R37-R2	R2	6 12 24	45/40 45/40 55/50	P45t P45t P45t
60809-IEC-2120-	R37-H4	H4	12 24	60/55 75/70	P43t-38 P43t-38
60809-IEC-2125-	-	H6	12	65/55	PZ43t
60809-IEC-2130-	R37-HS1	HS1	6 12	35/35 35/35	PX43t PX43t
60809-IEC-2132-	R37-HS5	HS5	12	35/30	P23t
60809-IEC-2135-	-	HB1	12	65/45	P29t
60809-IEC-2140-	R37-S1/S2	S1	6 12	25/25 25/25	BA20d BA20d

⁵ If a UN sheet number is referenced in the second column, the IEC sheet number refers to a data sheet withdrawn with Amendment 5 of Edition 2 of this standard and is given for information only.

⁶ The number in front of the dash indicates the number of the UN regulation.

IEC sheet no. ⁵	UN sheet no. ⁶	Category	Voltage V	Wattage W	Cap
60809-IEC-2150-	R37-S1/S2	S2	6 12	35/35 35/35	BA20d BA20d
60809-IEC-2160-	-	S4	6 12	15/15 15/15	BAX15d BAX15d
60809-IEC-2305-	-	H5	12	50	PY43d
60809-IEC-2310-	R37-H1	H1	6 12 24	55 55 70	P14.5s P14.5s P14.5s
60809-IEC-2315-	R37-H7	H7	12 24	55 70	PX26d PX26d
60809-IEC-2320-	-	H2	6 12 24	55 55 70	X511 X511 X511
60809-IEC-2325-	R37-HB3	HB3 HB3A	12 12	60 60	P20d P20d
60809-IEC-2330-	R37-H3	H3	6 12 24	55 55 70	PK22s PK22s PK22s
60809-IEC-2335-	R37-HB4	HB4 HB4A	12 12	51 51	P22d P22d
60809-IEC-2340-	R37-HS2	HS2	6 12	15 15	PX13.5s PX13.5s
60809-IEC-2350-	-	HS3	6	2,4	PX13.5s
60809-IEC-2360-	R37-S3	S3	6 12	15 15	P26s P26s
60809-IEC-2365-	R37-H8	H8	12	35	PGJ19-1
60809-IEC-2370-	R37-H9	H9	12	65	PGJ19-5
60809-IEC-2375-	R37-H10	H10	12	42	PY20d
60809-IEC-2380-	R37-H11	H11	12 24	55 70	PGJ19-2 PGJ19-2
60809-IEC-2385-	R37-H12	H12	12	53	PZ20d
60809-IEC-2410-	R37-HIR1	HIR1	12	65	PX20d
60809-IEC-2420-	R37-HIR2	HIR2	12	55	PX22d
60809-IEC-3110-	R37-P21/5W	P21/5W	6 12 24	21/5 21/5 21/5	BAY15d BAY15d BAY15d
60809-IEC-3120-	R37-P21/4W	P21/4W	6 12 24	21/4 21/4 21/4	BAZ15d BAZ15d BAZ15d
60809-IEC-3130-	R37-W21/5W	W21/5W	12	21/5	W3x16q
60809-IEC-3135-	R37-WR21/5W	WR21/5W	12	21/5	WY3x16q
60809-IEC-3140-	R37-PR27/7W	PR27/7W	12	27/7	W2.5x16q
60809-IEC-3141-	R37-PY27/7W	PY27/7W	12	27/7	WX2.5x16q
60809-IEC-3310-	R37-P21W	P21W	6 12 24	21 21 21	BA15s(BA15d) BA15s(BA15d) BA15s(BA15d)
60809-IEC-3311-	R37-PY21W	PY21W	12 24	21 21	BAU15s BAU15s
60809-IEC-3315-	R37-P27W	P27W	12	27	W2.5x16d
60809-IEC-3320-	R37-R5W	R5W	6 12 24	5 5 5	BA15s(BA15d) BA15s(BA15d) BA15s(BA15d)

IEC sheet no. ⁵	UN sheet no. ⁶	Category	Voltage V	Wattage W	Cap
60809-IEC-3330-	R37-R10W	R10W	6 12 24	10 10 10	BA15s(BA15d) BA15s(BA15d) BA15s(BA15d)
60809-IEC-3340-	R37-T4W	T4W	6 12 24	4 4 4	BA9s BA9s BA9s
60809-IEC-3410-	R37-H6W	H6W	12	6	BAX9s
60809-IEC-3420-	R37-H21W	H21W	12 24	21 21	BAY9s BAY9s
60809-IEC-3430	R37-H27W	H27W/1 H27W/2	12 12	27 27	PG13 PGJ13
60809-IEC-4110-	R37-C5W	C5W	6 12 24	5 5 5	SV8.5 SV8.5 SV8.5
60809-IEC-4120-	R37-C21W	C21W	12	21	SV8.5
60809-IEC-4305-	R37-W2.3W	W2.3W	12	2,3	W2x4.6d
60809-IEC-4310-	R37-W3W	W3W	6 12 24	3 3 3	W2.1x9.5d W2.1x9.5d W2.1x9.5d
60809-IEC-4320-	R37-W5W	W5W	6 12 24	5 5 5	W2.1x9.5d W2.1x9.5d W2.1x9.5d
60809-IEC-4321-	R37-W5W	WY5W	6 12 24	5 5 5	W2.1x9.5d W2.1x9.5d W2.1x9.5d
60809-IEC-4330-	R37-W21W	W21W	12	21	W3x16d
60809-IEC-4335-	R37-WY21W	WY21W	12	21	WX3x16d
60809-IEC-4340-	R37-W16W	W16W	12	16	W2.1x9.5d
60809-IEC-5010-	R37-T1.4W	T1.4W	12	1,4	P11.5d
60809-IEC-7110-	R99-DxS	D1S D2S D3S D4S	12 12 12 12	35 35 35 35	PK32d-2 P32d-2 PK32d-5 P32d-5
60809-IEC-7120-	R99-DxR	D1R D2R D3R D4R	12 12 12 12	35 35 35 35	PK32d-3 P32d-3 PK32d-6 P32d-6
60809-IEC-9310-	-	B1.13W	2,7	1,13	PX13.5s
60809-IEC-9610-	-	B0.6W	6	0,6	E10
60809-IEC-9620-	-	B2.4W	6	2,4	EP10/14x11
-	R37-H10W	H10W/1 HY10W	12 12	10 10	BAU9s BAUZ9s
-	R37-H11	H11B	12 24	55 70	PGJY19-2 PGJY19-2
-	R37-H13	H13 H13A	12 12	55/60 55/60	P26.4t PJ26.4t
-	R37-H14	H14	12	55/60	P38t
-	R37-H15	H15	12 24	15/55 20/60	PGJ23t-1 PGJ23t-1
-	R37-H16	H16 H16B	12 12	19 19	PGJ19-3 PGJY19-3
-	R37-H21W	HY21W	12 24	21 21	BAW9s BAW9s

IEC sheet no. ⁵	UN sheet no. ⁶	Category	Voltage V	Wattage W	Cap
-	R37-H6W	HY6W	12	6	BAZ9s
-	R37-H8	H8B	12	35	PGJY19-1
-	R37-H9	H9B	12	65	PGJY19-5
-	R37-HS5A	HS5A	12	45/40	PX23t
-	R37-P13W	P13W PW13W	12 12	13 13	PG18.5d-1 WP3.3x14.5-7
-	R37-P19W	P19W PY19W PR19W PS19W PSY19W PSR19W PW19W PWR19W PWY19W	12 12 12 12 12 12 12 12 12	19 19 19 19 19 19 19 19 19	PGU20-1 PGU20-2 PGU20-5 PG20-1 PG20-2 PG20-5 WP3.3x14.5-1 WP3.3x14.5-2 WP3.3x14.5-5
-	R37-P24W	P24W PX24W PY24W PR24W PS24W PSX24W PSY24W PSR24W PW24W PWR24W PWY24W	12 12 12 12 12 12 12 12 12 12 12	24 24 24 24 24 24 24 24 24 24 24	PGU20-3 PGU20-7 PGU20-4 PGU20-6 PG20-3 PG20-7 PG20-4 PG20-6 WP3.3x14.5-3 WP3.3x14.5-4 WP3.3x14.5-6
-	R37-P27/7W	P27/7W	12	27/7	WU2.5x16
-	R37-PC16W	PC16W PCY16W PCR16W PW16W PWR16W PWY16W	12 12 12 12 12 12	16 16 16 16 16 16	PU20d-1 PU20d-2 PU20d-7 WP3.3x14.5-8 WP3.3x14.5-9 WP3.3x14.5-10
-	R37-PR21/4W	PR21/4W	12 24	21/4 21/4	BAU15d BAU15d
-	R37-PR21/5W	PR21/5W	12 24	21/5 21/5	BAW15d BAW15d
-	R37-PR21W	PR21W	12 24	21 21	BAW15s BAW15s
-	R37-PSX26W	PSX26W	12	26	PG18.5d-3
-	R37-R10W	RR10W RR10W RR10W RY10W RY10W RY10W	6 12 24 6 12 24	10 10 10 10 10 10	BAW15s BAW15s BAW15s BAU15s BAU15s BAU15s
-	R37-R5W	RR5W	6 12 24	5 5 5	BAW15s BAW15s BAW15s
-	R37-W10W	W10W W10W WY10W WY10W	6 12 6 12	10 10 10 10	W2.1x9.5d W2.1x9.5d W2.1x9.5d W2.1x9.5d
-	R37-W15/5W	W15/5W	12	15/5	WZ3x16q
-	R37-W16W	WY16W	12	16	W2.1x9.5d
-	R37-W5W	WR5W	6 12 24	5 5 5	W2.1x9.5d W2.1x9.5d W2.1x9.5d

IEC sheet no. ⁵	UN sheet no. ⁶	Category	Voltage V	Wattage W	Cap
-	R37-WP21W	WP21W WPY21W	12 12	21 21	WY2.5x16d WZ2.5x16d
-	R37-WR21/5W	WR21/5W	12	21/5	WY3x16q
-	R37-WY2.3W	WY2.3W	12	2,3	W2x4.6d
-	R37-WY21W	WY21W	12	21	WX3x16d
-	R99-D5S	D5S	12	25	PK32d-7
-	R99-D6S	D6S	12	25	P32d-1
-	R99-D8S	D8S	12	25	PK32d-1
-	R37-H17	H17	12	35	PU43t-4
-	R37-PY21/5W	PY21/5W	12	21/5	BA15d-3 (100°/130°)
-	R37-WT21W	WT21W	12 24	21 21	WUX2.5x16d WUX2.5x16d
-	R37-WT21W	WTY21W	12 24	21 21	WUY2.5x16d WUY2.5x16d
-	R37-WT21/7W	WT21/7W	12	21/7	WZX2.5x16q
-	R37-WT21/7W	WTY21/7W	12	21/7	WZY2.5x16q
	R128-LR1	LR1	12	0,75/3,5	PGJ21t-1
	R128-LW2	LW2	12	1/12	PGJY50

Without

LAMPES À FILAMENT POUR VÉHICULES ROUTIERS FEUILLE DE CARACTÉRISTIQUES CATÉGORIE: H6 CULOT: PZ43t		ROAD VEHICLE FILAMENT LAMP DATA SHEET CATEGORY: H6 CAP: PZ43t		Page 1
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Tension nominale Nominal voltage	[V]	12
Puissance nominale Nominal wattage	[W]	65/55
Tension d'essai Test voltage	[V]	13,2

Dessin de la lampe à filament - Filament lamp drawing

Les dessins ont pour seul but d'illustrer les dimensions essentielles de la lampe à filament.
The drawings are intended only to illustrate the essential dimensions of the filament lamp.

Dimensions en millimètres - Dimensions in millimetres

The drawing consists of two views: a side view on the left and a front view on the right. The side view shows the lamp's profile with a reference axis (Axe de référence) passing through the center. Key dimensions include a maximum length of 60 mm, a distance 'e' from the base to the center, a maximum height of 17.0 mm, and a base diameter of 17.0 mm. Labels include 'Languette de référence' (Reference lug), 'Croisement Dipped-beam', 'Route Main-beam', and 'Plan de référence' (Reference axis). The front view shows the circular base with a diameter 'M', a reference axis, and labels for 'Masse Common' and 'Route Main-beam'. An angle 'β' is indicated between the reference axis and the main beam.

Culot
PZ43t selon la CEI 61-1 (feuille 7004-89).

Axe de référence
L'axe de référence est perpendiculaire au plan de référence et passe par le centre du cercle de diamètre M.

Ampoule
L'ampoule doit être incolore.

Cap
PZ43t in accordance with IEC 61-1 (sheet 7004-89).

Reference axis
The reference axis is perpendicular to the reference plane and passes through the centre of circle of diameter M.

Bulb
The bulb shall be colourless.

IEC

Publication CEI 809
IEC Publication 809

809-IEC-2125-2

Date: 1995

LAMPES À FILAMENT POUR VÉHICULES ROUTIERS FEUILLE DE CARACTÉRISTIQUES CATÉGORIE: H6 CULOT: PZ43t		ROAD VEHICLE FILAMENT LAMP DATA SHEET CATEGORY: H6 CAP: PZ43t	Page 2
Caractéristiques et dimensions des lampes à filament Filament lamps characteristics and dimensions			
Caractéristiques Characteristics	Valeurs Values	Tolérances et valeurs limites Tolerances and limiting values	
	Lampes de fabrication Production lamps		
Tension nominale Nominal voltage	12 V	12 V	
Puissance assignée [W] Rated wattage Filament route Main-beam filament Filament croisement Dipped-beam filament	— —	76 max. 1) 64 max. 2)	
Flux lumineux assigné [lm] Rated luminous flux Filament route Main-beam filament Filament croisement Dipped-beam filament	1 320 880	±15 % ±15 %	
Dimensions [mm] e 3) t Ecart latéral / Lateral deviation β 5)	26,0 — — 90°	±0,3 3,0 min. 4) 0,5 max. 4) ±15 4)	

1) Valeurs calculées à 5,76 A max.

2) Valeurs calculées à 4,85 A max.

3) Cette dimension désigne le filament route.

4) A l'étude.

5) Angle (degrés) de l'axe de la languette de référence par rapport aux filaments.

1) Calculated values at 5,76 A max.

2) Calculated values at 4,85 A max.

3) This dimension specifies main-beam filament.

4) Under consideration.

5) Reference lug rotation with respect to filament (degrees).

Publication CEI 809
IEC Publication 809

809-IEC-2125-2

Docu

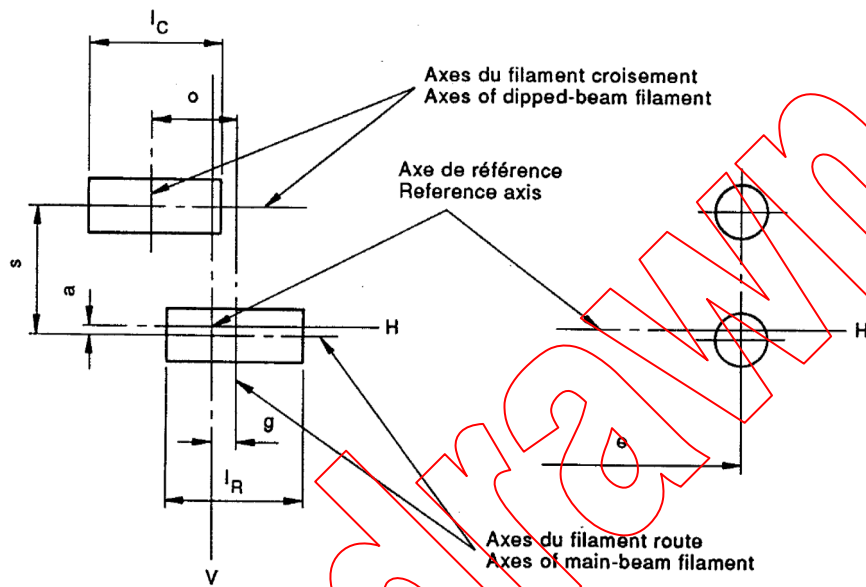
Date: 199

**LAMPES À FILAMENT
POUR VÉHICULES ROUTIERS
FEUILLE DE CARACTÉRISTIQUES
CATÉGORIE: H6
CULOT: PZ43t**

**ROAD VEHICLE
FILAMENT LAMP
DATA SHEET
CATEGORY: H6
CAP: PZ43t**

Page 3

Position des filaments / Position of filaments



IEC

Dimensions en millimètres - Dimensions in millimetres

Type	a	g	o	s	l_C	l_R
12 V	$0 \pm 0,35$ ¹⁾	$0 \pm 0,35$ ¹⁾	2,4 nom.	2,4 nom.	6,0 max.	6,0 max.

¹⁾ A l'étude.
Under consideration.

**LAMPES À FILAMENT
POUR VÉHICULES ROUTIERS
FEUILLE DE CARACTÉRISTIQUES
CATÉGORIE: HB1
CULOT: P29t**

**ROAD VEHICLE
FILAMENT LAMP
DATA SHEET
CATEGORY: HB1
CAP: P29t**

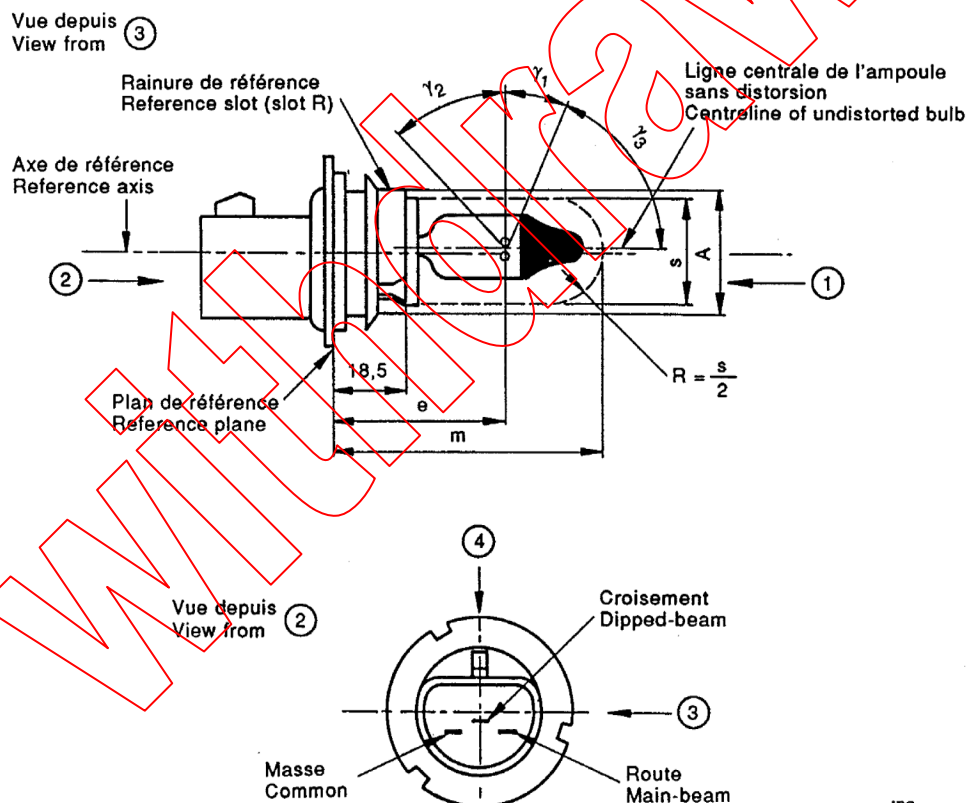
Page 1

Tension nominale Nominal voltage	[V]	12
Puissance nominale Nominal wattage	[W]	65/45
Tension d'essai Test voltage	[V]	13,2

Dessin de la lampe à filament - Filament lamp drawing

Les dessins ont pour seul but d'illustrer les dimensions essentielles de la lampe à filament.
The drawings are intended only to illustrate the essential dimensions of the filament lamp.

Dimensions en millimètres - Dimensions in millimetres



Culot

P29t selon la CEI 61-1 (feuille 7004-66-).

Encombrement maximal de la lampe

Il doit être possible d'insérer la lampe dans un cylindre de diamètre s , concentrique à l'axe de référence et limité à une extrémité par un plan parallèle à, et situé à 18,5 mm du plan de référence, et à l'autre extrémité par une demi-sphère de rayon $s/2$.

Cap

P29t in accordance with IEC 61-1 (sheet 7004-66-).

Maximum lamp outline

It shall be possible to insert the lamp into a cylinder of diameter s concentric with the reference axis and limited at one end by a plane parallel to and 18,5 mm distant from the reference plane and at the other end by a hemisphere of radius $s/2$.

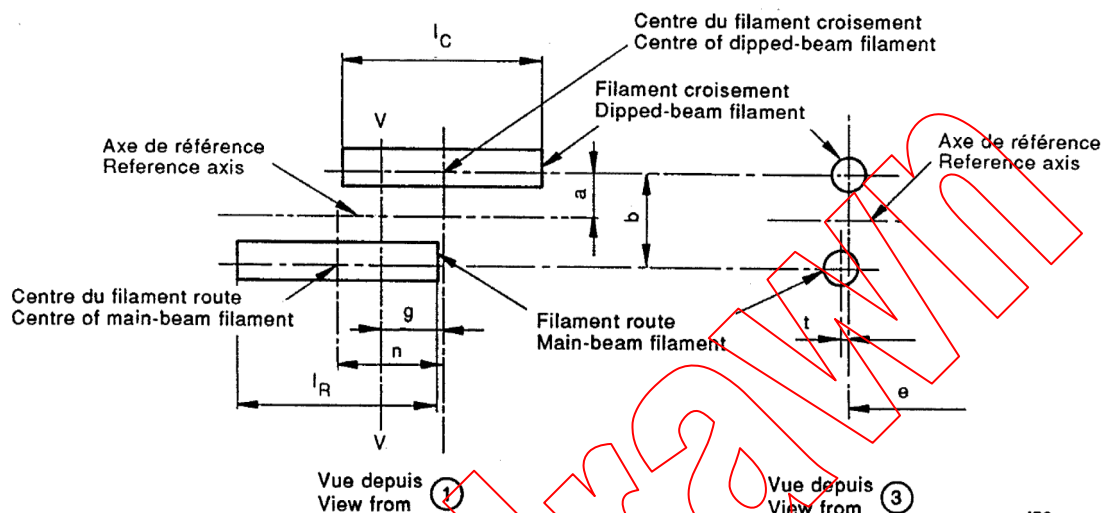
LAMPES À FILAMENT POUR VÉHICULES ROUTIERS FEUILLE DE CARACTÉRISTIQUES CATÉGORIE: HB1 CULOT: P29t		ROAD VEHICLE FILAMENT LAMP DATA SHEET CATEGORY: HB1 CAP: P29t		Page 2																																																																		
Axe de référence L'axe de référence est perpendiculaire au plan de référence et passe par le centre d'un cercle de diamètre A. Ampoule Incolore avec calotte noire. Le corps de l'ampoule en verre doit être cylindrique et exempt de distorsion à l'intérieur des angles γ_1 et γ_2. Cette exigence s'applique à la totalité de la circonférence de l'ampoule entre les angles γ_1 et γ_2. L'occultation doit couvrir au moins l'angle γ_3 et doit aller au moins aussi loin que la partie de l'ampoule sans distorsion, définie par l'angle γ_1. Le sommet des angles γ_1, γ_2 et γ_3 est l'intersection entre l'axe de l'ampoule sans distorsion et le plan de référence parallèle à, et situé à 44,5 mm (cote e) du plan de référence.		Reference axis The reference axis is the line perpendicular to the reference plane and passing through the centre of the circle of diameter A. Bulb Colourless, with black top obscuration. The glass bulb periphery shall be optically distortion free and cylindrical within the angles γ_1 and γ_2. This requirement applies to the whole bulb circumference within the angles γ_1 and γ_2. The obscuration shall extend at least over angle γ_3 and shall be at least as far as the undistorted part of the bulb defined by angle γ_1. The apex of the angles γ_1, γ_2 and γ_3 is the intersection between the axis of the undistorted bulb with a plane parallel to and 44,5 mm distant (dimension e) from the reference plane.																																																																				
Caractéristiques et dimensions des lampes à filament Filament lamp characteristics and dimensions																																																																						
<table><tr><th rowspan="2">Caractéristiques Characteristics</th><th rowspan="2">Valeurs Values</th><th colspan="2">Tolérances et valeurs limites Tolerances and limiting values</th></tr><tr><th>Lampes de fabrication Production lamps</th><th>Lampes étalon Standard lamps</th></tr><tr><td>Tension nominale Nominal voltage</td><td>12 V</td><td>12 V</td><td>12 V</td></tr><tr><td>Puissance assignée Rated wattage</td><td></td><td></td><td></td></tr><tr><td>Filament route Main-beam filament</td><td>—</td><td>73 max.</td><td>73 max.</td></tr><tr><td>Filament croisement Dipped-beam filament</td><td>—</td><td>52 max.</td><td>52 max.</td></tr><tr><td>Flux lumineux assigné Rated luminous flux</td><td></td><td></td><td></td></tr><tr><td>Filament route Main-beam filament</td><td>1 320</td><td>±12 %</td><td>1)</td></tr><tr><td>Filament croisement Dipped-beam filament</td><td>770</td><td>±12 %</td><td>1)</td></tr><tr><td>Dimensions [mm]</td><td></td><td></td><td></td></tr><tr><td>A</td><td>28,55</td><td>±0,05</td><td>±0,05</td></tr><tr><td>e</td><td>44,50</td><td>±0,25</td><td>±0,15</td></tr><tr><td>m</td><td>—</td><td>70 max.</td><td>70 max.</td></tr><tr><td>s</td><td>24,50</td><td>nom.</td><td>nom.</td></tr><tr><td>γ_1</td><td>38°</td><td>±5°</td><td>±5°</td></tr><tr><td>γ_2</td><td>—</td><td>43° min.</td><td>43° min.</td></tr><tr><td>γ_3</td><td>52°</td><td>±5°</td><td>±5°</td></tr></table>					Caractéristiques Characteristics	Valeurs Values	Tolérances et valeurs limites Tolerances and limiting values		Lampes de fabrication Production lamps	Lampes étalon Standard lamps	Tension nominale Nominal voltage	12 V	12 V	12 V	Puissance assignée Rated wattage				Filament route Main-beam filament	—	73 max.	73 max.	Filament croisement Dipped-beam filament	—	52 max.	52 max.	Flux lumineux assigné Rated luminous flux				Filament route Main-beam filament	1 320	±12 %	1)	Filament croisement Dipped-beam filament	770	±12 %	1)	Dimensions [mm]				A	28,55	±0,05	±0,05	e	44,50	±0,25	±0,15	m	—	70 max.	70 max.	s	24,50	nom.	nom.	γ_1	38°	±5°	±5°	γ_2	—	43° min.	43° min.	γ_3	52°	±5°	±5°
Caractéristiques Characteristics	Valeurs Values	Tolérances et valeurs limites Tolerances and limiting values																																																																				
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γ_2	—	43° min.	43° min.																																																																			
γ_3	52°	±5°	±5°																																																																			
1) Flux lumineux d'essai 990 lm et 570 lm à environ 12 V. 1) Test luminous flux 990 lm and 570 lm at approximately 12 V.																																																																						
Publication CEI 809 IEC Publication 809		809-IEC-2135-1		Date: 1995																																																																		

**LAMPES À FILAMENT
POUR VÉHICULES ROUTIERS
FEUILLE DE CARACTÉRISTIQUES
CATÉGORIE: HB1
CULOT: P29t**

**ROAD VEHICLE
FILAMENT LAMP
DATA SHEET
CATEGORY: HB1
CAP: P29t**

Page 3

Position des filaments / Position of filaments
Dimensions en millimètres - Dimensions in millimetres



Le plan V-V est perpendiculaire au plan de référence et contient l'axe de référence et la ligne centrale de la rainure R du culot.

The plane V-V is perpendicular to the reference plane and contains the reference axis and the centreline of the slot R of the cap.

IEC

**Dimensions des filaments
Filament dimensions**

Dimensions ¹⁾	Valeurs Values	Tolérances et valeurs limites Tolerances and limiting values	
		Lampes de fabrication Production lamps	Lampes étalon Standard lamps
Tension nominale Nominal voltage	12 V	12 V	12 V
a	1,15	±0,38	±0,20
b	2,30	±0,64	±0,25
g	1,20	±0,38	±0,20
l_C ²⁾	4,80	±0,40	±0,40
l_R ³⁾	4,80	±0,40	±0,40
n	2,40	±0,80	±0,40
t	0,00	±0,64	±0,25

1) La méthode de mesure est spécifiée dans l'annexe F.

1) The method of measurement is specified in annex F.

2) L'écart de linéarité du filament croisement ne doit pas dépasser 0,3 fois le diamètre réel d'une spire.

2) The deviation of the straightness of the dipped-beam filament shall not exceed 0,3 times the actual diameter of the coil.

3) L'écart de linéarité du filament route ne doit pas dépasser 0,4 fois le diamètre réel d'une spire.

3) The deviation of the straightness of the main-beam filament shall not exceed 0,4 times the actual diameter of the coil.

**LAMPES À FILAMENT
POUR VÉHICULES ROUTIERS
FEUILLE DE CARACTÉRISTIQUES
CATÉGORIE: S4
CULOT: BAX15d**

**ROAD VEHICLE
FILAMENT LAMP
DATA SHEET
CATEGORY: S4
CAP: BAX15d**

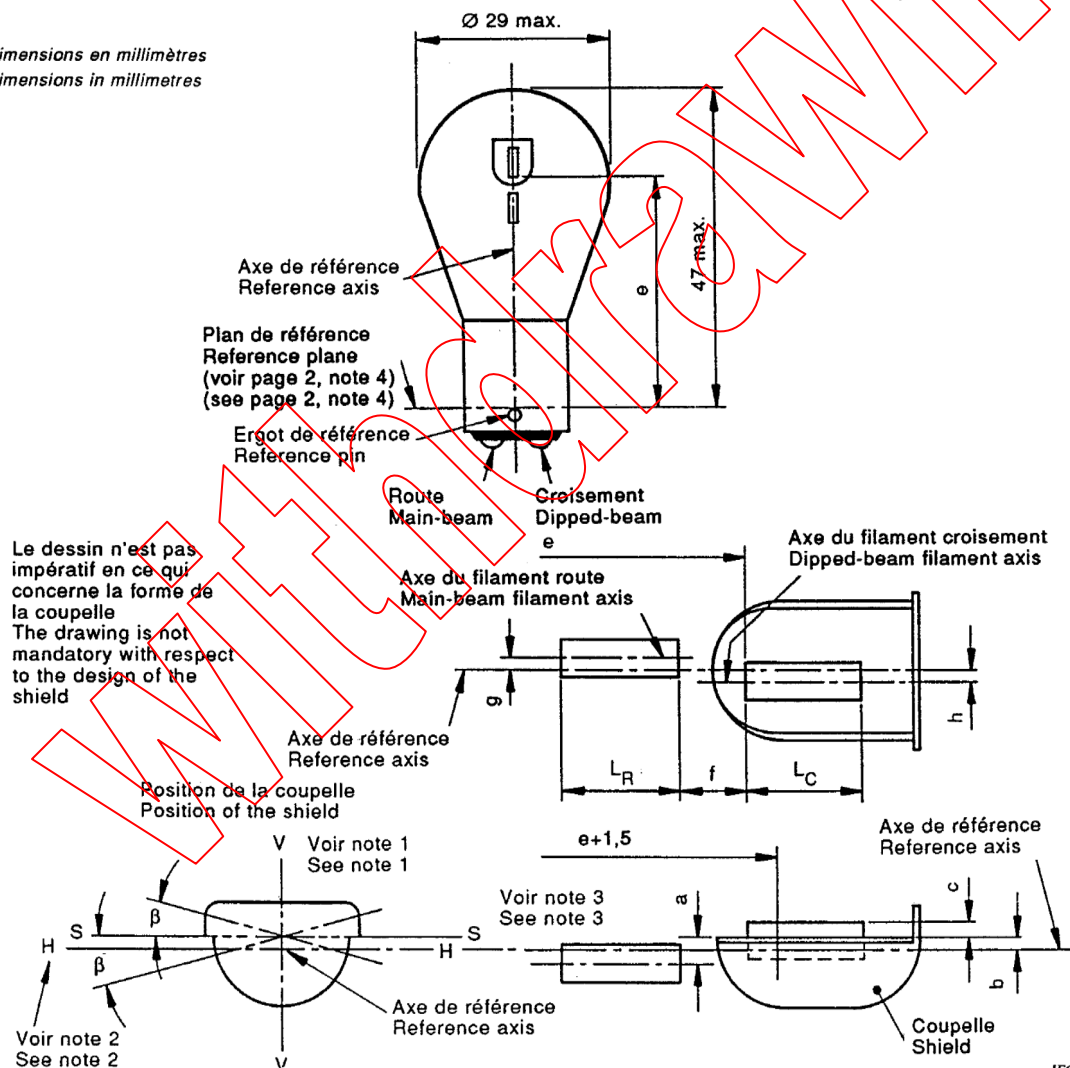
Page 1

Tension nominale Nominal voltage	[V]	6	12
Puissance nominale Nominal wattage	[W]	15/15	15/15
Tension d'essai Test voltage	[V]	6,75	13,5

Dessin de la lampe à filament - Filament lamp drawing

Les dessins ont pour seul but d'illustrer les dimensions essentielles de la lampe à filament.
The drawings are intended only to illustrate the essential dimensions of the filament lamp.

Dimensions en millimètres
Dimensions in millimetres



NOTES

- 1 Le plan V-V contient l'axe de référence et passe par la ligne du centre de l'ergot de référence.
- 2 Le plan H-H contient l'axe de référence et est perpendiculaire au plan V-V.
- 3 Le plan S-S indique la position du plan parallèle au plan H-H et passant par les bords de la coupelle.

NOTES

- 1 Plane V-V contains the reference axis and the centre line of the reference pin.
- 2 Plane H-H contains the reference axis and is perpendicular to plane V-V.
- 3 Plane S-S denotes the position of the plane through the shield edges parallel to plane H-H.

LAMPES À FILAMENT POUR VÉHICULES ROUTIERS FEUILLE DE CARACTÉRISTIQUES CATÉGORIE: S4 CULOT: BAX15d		ROAD VEHICLE FILAMENT LAMP DATA SHEET CATEGORY: S4 CAP: BAX15d		Page 2
<i>Culot</i> BAX15d selon la CEI 61-1 (feuille 7004-18-).		<i>Cap</i> BAX15d in accordance with IEC 61-1 (sheet 7004-18-).		
<i>Ampoule</i> Incolore ou jaune-sélectif.		<i>Bulb</i> Colourless or selective-yellow.		
Caractéristiques et dimensions des lampes à filament Filament lamp characteristics and dimensions				
Caractéristiques Characteristics	Valeurs Values		Tolérances et valeurs limites Tolerances and limiting values	
			Lampes de fabrication Production lamps	Lampes étalon Standard lamps
Tension nominale Nominal voltage	6 V	12 V	6 V	12 V
Puissance assignée Rated wattage [W]				
Filament route Main-beam filament	15		±6 %	±6 %
Filament croisement Dipped-beam filament	15		±6 %	±6 %
Flux lumineux assigné Rated luminous flux [lm]				
Filament route Main-beam filament	—		180 min.	1)
Filament croisement Dipped-beam filament	—		125 min. 190 max.	1)
Dimensions [mm]				
e	33,6		±0,35	±0,15
f	1,8		±0,35	±0,2
L _C - L _R	3,5		±1,0	±0,5
c 2)	0,4		±0,35	±0,15
b 2)	0,2		±0,35	±0,15
a 2)	0,6		±0,35	±0,15
h	0,0		±0,5	±0,2
g	0,0		±0,5	±0,2
β 2) 3)	0,0		±2°30'	±1°
1) Flux lumineux d'essai 240 lm (route) et 160 lm (croisement) à environ 6 V. 2) Les dimensions a, b, c et β se réfèrent à un plan, parallèle au plan de référence, et coupant les deux bords de la coupelle, à une distance de e + 1,5 mm. 3) Ecart angulaire admissible du plan passant par les bords de la coupelle, par rapport à la position normale. 4) Le plan de référence est perpendiculaire à l'axe de référence, et touche la face supérieure de l'ergot de référence, ayant une longueur de 2 mm.				
1) Test luminous flux 240 lm (main-beam) and 160 lm (dipped-beam) at approximately 6 V. 2) Dimensions a, b, c and β refer to a plane parallel to the reference plane and cutting the two edges of the shield at a distance of e + 1,5 mm. 3) Admissible angular deviation of the plane through the shield edges from the objective position. 4) The reference plane is perpendicular to the reference axis and touches the upper surface of the reference pin having a length of 2 mm.				
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LAMPES À FILAMENT POUR VÉHICULES ROUTIERS FEUILLE DE CARACTÉRISTIQUES CATÉGORIE: H5 CULOT: PY43d		ROAD VEHICLE FILAMENT LAMP DATA SHEET CATEGORY: H5 CAP: PY43d		Page 1									
<table><tr><td>Tension nominale Nominal voltage</td><td>[V]</td><td>12</td></tr><tr><td>Puissance nominale Nominal wattage</td><td>[W]</td><td>50</td></tr><tr><td>Tension d'essai Test voltage</td><td>[V]</td><td>13,2</td></tr></table>					Tension nominale Nominal voltage	[V]	12	Puissance nominale Nominal wattage	[W]	50	Tension d'essai Test voltage	[V]	13,2
Tension nominale Nominal voltage	[V]	12											
Puissance nominale Nominal wattage	[W]	50											
Tension d'essai Test voltage	[V]	13,2											
Dessin de la lampe à filament - Filament lamp drawing Les dessins ont pour seul but d'illustrer les dimensions essentielles de la lampe à filament. The drawings are intended only to illustrate the essential dimensions of the filament lamp. <i>Dimensions en millimètres - Dimensions in millimetres</i> The technical drawing consists of two views of a filament lamp. The left view is a side profile showing the bulb, the cap, and the base. Key dimensions include a maximum length of 60 mm, a distance 'e' from the base to the bulb, and a maximum diameter of 17.0 mm. Labels include 'Languette de référence' (Reference lug), 'Axe de référence' (Reference axis), and 'Plan de référence' (Reference plane). The right view is a front view showing the circular cap with diameter 'M' and a reference angle 'β'. The IEC logo is at the bottom right of the drawing area. Culot PY43d selon la CEI 61-1 (feuille 7004-88-). Axe de référence L'axe de référence est la ligne perpendiculaire au plan de référence, qui passe par le centre du cercle de diamètre M. Ampoule L'ampoule doit être incolore. Cap PY43d in accordance with IEC 61-1 (sheet 7004-88-). Reference axis The reference axis is the line perpendicular to the reference plane and passes through the centre of the circle of diameter M. Bulb The bulb shall be colourless.													
Publication CEI 809 IEC Publication 809		809-IEC-2305-2		Date: 1995 Documents Document Sharing Hub									

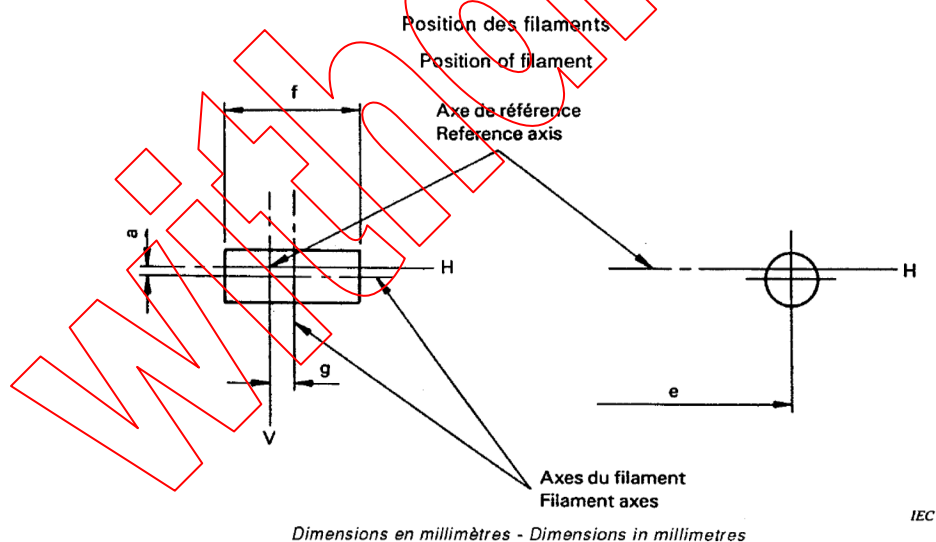
**LAMPES À FILAMENT
POUR VÉHICULES ROUTIERS
FEUILLE DE CARACTÉRISTIQUES
CATÉGORIE: H5
CULOT: PY43d**

**ROAD VEHICLE
FILAMENT LAMP
DATA SHEET
CATEGORY: H5
CAP: PY43d**

Page 2

**Caractéristiques et dimensions des lampes à filament
Filament lamp characteristics and dimensions**

Caractéristiques Characteristics	Valeurs Values	Tolérances et valeurs limites Tolerances and limiting values
Lampes de fabrication / Production lamps		
Tension nominale Nominal voltage	12 V	12 V
Puissance assignée Rated wattage [W]	—	58 max. 1)
Flux lumineux Rated luminous flux [lm]	1 210	±15 %
Dimensions [mm]		
e Ecart latéral / Lateral deviation β 3)	26,0 90°	±0,3 0,5 max. 2) ±15 2)



Type	a	g	f
12 V	0 + 0,35 4)	0 + 0,35 4)	6,0 max.

- 1) Valeurs calculées à 4,39 A max.
2) A l'étude.
3) Angle (degrés) de l'axe de la languette de référence par rapport au filament.
4) A l'étude.

- 1) Calculated values at 4,39 A max.
2) Under consideration.
3) Reference lug rotation with respect to filament (degrees).
4) Under consideration.

**LAMPES À FILAMENT
POUR VÉHICULES ROUTIERS
FEUILLE DE CARACTÉRISTIQUES
CATÉGORIE: H2
CULOT: X511**

**ROAD VEHICLE
FILAMENT LAMP
DATA SHEET
CATEGORY: H2
CAP: X511**

Page 1

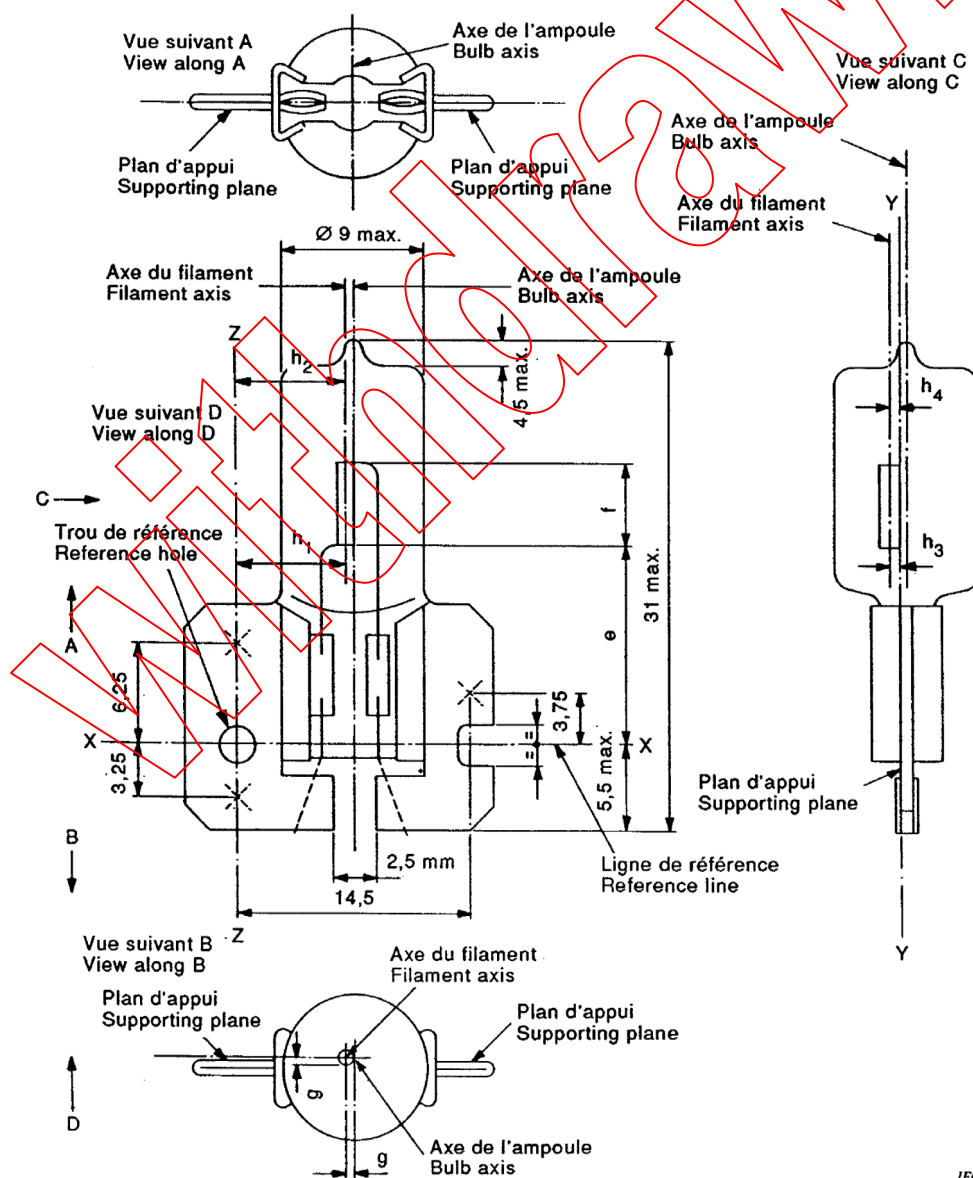
Tension nominale Nominal voltage [V]	6	12	24
Puissance nominale Nominal wattage [W]	55	55	70
Tension d'essai Test voltage [V]	6,3	13,2	28,0

Dessin de la lampe à filament - Filament lamp drawing

Les dessins ont pour seul but d'illustrer les dimensions essentielles de la lampe à filament.

The drawings are intended only to illustrate the essential dimensions of the filament lamp.

Dimensions en millimètres - Dimensions in millimetres



IEC

LAMPES À FILAMENT POUR VÉHICULES ROUTIERS FEUILLE DE CARACTÉRISTIQUES CATÉGORIE: H2 CULOT: X511				ROAD VEHICLE FILAMENT LAMP DATA SHEET CATEGORY: H2 CAP: X511				Page 2
Culot X511 selon la CEI 61-1 (feuille 7004-99-). Les trois croix sur le plan d'appui indiquent les positions des sommets des trois bossages délimitant le plan d'appui sur la douille. Centré sur trois points et à l'intérieur d'un cercle de diamètre 3 mm, il ne doit exister aucune déformation apparente, ni aucune gravure influençant le positionnement de la lampe. Ampoule Incolore ou jaune-sélectif.				Cap X511 in accordance with IEC 61-1 (sheet 7004-99-). The three crosses on the supporting plane show the position of the three bosses defining this plane on the holder. Within a circle 3 mm in diameter centred on these points there should be no apparent deformation and no notches affecting the positioning of the lamp. Bulb Colourless or selective-yellow.				
Caractéristiques et dimensions des lampes à filament Filament lamp characteristics and dimensions								
Caractéristiques Characteristics	Valeurs Values			Tolérances et valeurs limites Tolerances and limiting values				
				Lampes de fabrication Production lamps			Lampes étalon Standard lamps	
Tension nominale Nominal voltage	6 V	12 V	24 V	6 V	12 V	24 V	12 V	
Puissance assignée Rated wattage [W]	—	—	—	63 max.	68 max.	84 max.	68 max.	
Flux lumineux assigné Rated luminous flux [lm]	1 300	1 800	2 150	±15 %			1)	
Dimensions [mm]								
e 3)	12,25			2)			±0,15	
f 3)	4,5	5,5		±1,0			±0,50	
g 4) 5)	0,5 d			±0,5 d			±0,25 d	
h ₁ 6)	7,1			2)			±0,20	
h ₂ 6)	7,1			2)			±0,25	
h ₃ 4) 6)	0,5 d - 0,35			2)			±0,20	
h ₄ 4) 6)	0,5 d - 0,35			2)			±0,25	

1) Flux lumineux d'essai 1 300 lm à environ 12 V.

2) A vérifier au moyen du système de contrôle «box system», page 3.

3) Les extrémités du filament sont définies comme les points où, lorsque la direction de visée est définie comme indiqué par D (page 1), la projection de l'extérieur des spires d'extrémités les plus proches ou les plus éloignées du culot, croise une ligne parallèle à, et à une distance de 7,1 mm, de la ligne Z-Z.
(Instructions particulières pour les filaments bispiralés à l'étude.)

4) d diamètre du filament.

5) A mesurer dans une section transversale perpendiculaire à l'axe de l'ampoule et passant par l'extrémité du filament la plus proche du culot.

6) Les décalages h₁ et h₂ doivent être mesurés pour Z-Z, dans un plan parallèle au plan d'appui.
Les décalages h₃ et h₄ doivent être mesurés pour Y-Y, dans un plan perpendiculaire au plan d'appui.
Les points à mesurer sont ceux où la projection de l'extérieur des spires d'extrémités, les plus proches ou les plus éloignées du culot, croise l'axe du filament.

1) Test luminous flux 1 300 lm at approximately 12 V.

2) To be checked by means of the box system, page 3.

3) The ends of the filament are defined as the points where, when the viewing direction is as defined by D (page 1), the projection of the outside of the end turns nearest or farthest from the cap crosses a line parallel to and at a distance of 7,1 mm from the Z-Z line.
(Special instructions for coiled-coil filaments are under consideration.)

4) d diameter of filament.

5) To be measured in a cross-section perpendicular to the axis of the bulb and passing through that end of the filament which is nearer to the cap.

6) The offsets h₁ and h₂ shall be measured for Z-Z in a plane parallel to the supporting plane.
The offsets h₃ and h₄ shall be measured for Y-Y in a plane perpendicular to the supporting plane.
The points to be measured are those where the projection of the outside of the end turns nearest to or farthest from the cap crosses the filament axis.

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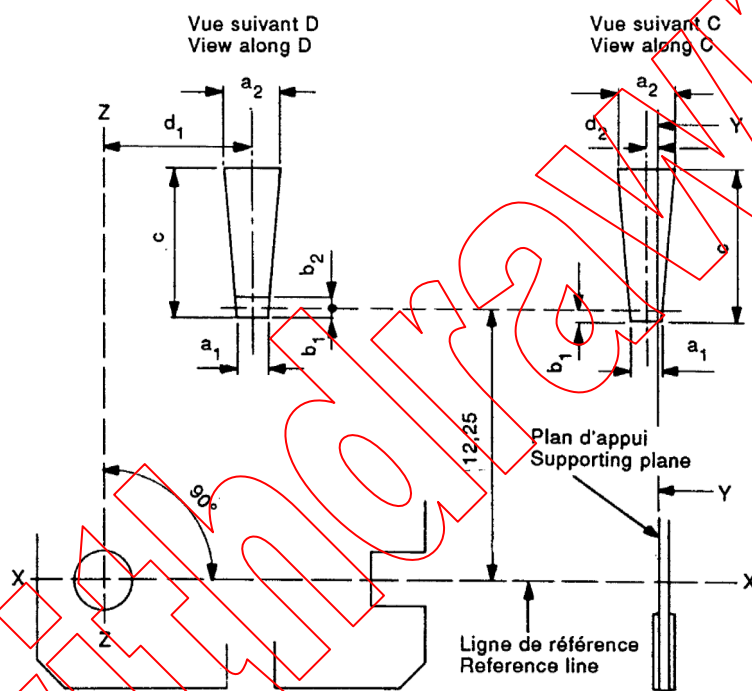
**LAMPES À FILAMENT
POUR VÉHICULES ROUTIERS
FEUILLE DE CARACTÉRISTIQUES
CATÉGORIE: H2
CULOT: X511**

**ROAD VEHICLE
FILAMENT LAMP
DATA SHEET
CATEGORY: H2
CAP: X511**

Page 3

Système de contrôle de la position du filament («box system») – (voir article A.10, annexe A)
Filament location check system (box system) – (see clause A.10, annex A)

Dimensions en millimètres - Dimensions in millimetres



IEC

Type	a_1	a_2	b_1	b_2	c	d_1	d_2
6 V	$d + 0,50$	$d + 1,0$	0,25	0,25	6	7,1	$0,5 d - 0,35$
12 V	$d + 0,50$	$d + 1,0$	0,25	0,25	7	7,1	$0,5 d - 0,35$
24 V	$d + 1,0$	$d + 1,0$	0,25	0,25	7	7,1	$0,5 d - 0,35$

d diamètre du filament.
 d diameter of the filament.

L'extrémité du filament qui est la plus proche du culot doit être située entre b_1 et b_2 .
L'extrémité du filament est définie dans la note 3, page 2.

The end of the filament which is nearer to the cap shall lie between b_1 and b_2 .
The end of the filament is defined in note 3, on page 2.

**LAMPES À FILAMENT
POUR VÉHICULES ROUTIERS
FEUILLE DE CARACTÉRISTIQUES
CATÉGORIE: HS3
CULOT: PX13.5s**

**ROAD VEHICLE
FILAMENT LAMP
DATA SHEET
CATEGORY: HS3
CAP: PX13.5s**

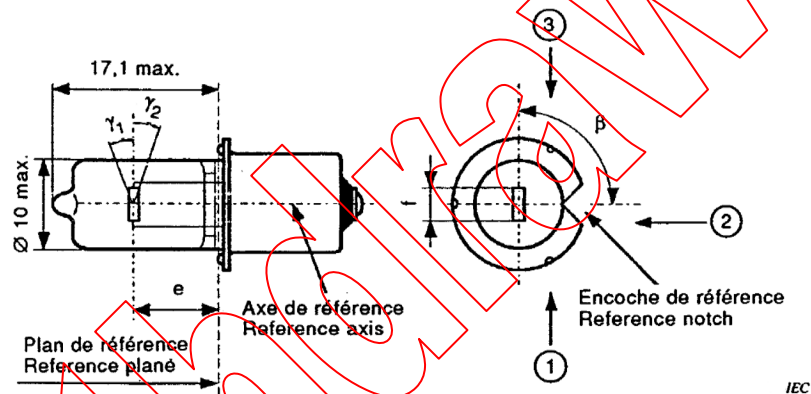
Page 1

Tension nominale Nominal voltage	[V]	6
Puissance nominale Nominal wattage	[W]	2,4
Tension d'essai Test voltage	[V]	6

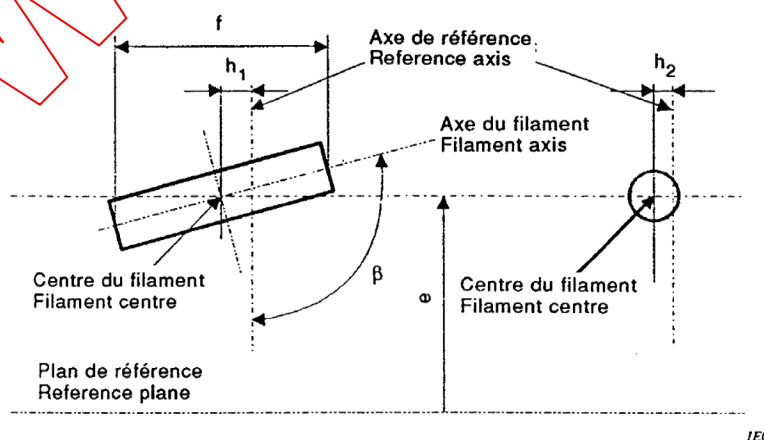
Dessin de la lampe à filament - Filament lamp drawing

Les dessins ont pour seul but d'illustrer les dimensions essentielles de la lampe à filament.
The drawings are intended only to illustrate the essential dimensions of the filament lamp.

Dimensions en millimètres - Dimensions in millimetres



Vue du filament indiquant les dimensions e, f, h₁ et h₂
View of filament showing dimension lines for e, f, h₁ and h₂



LAMPES À FILAMENT POUR VÉHICULES ROUTIERS FEUILLE DE CARACTÉRISTIQUES CATÉGORIE: HS3 CULOT: PX13.5s		ROAD VEHICLE FILAMENT LAMP DATA SHEET CATEGORY: HS3 CAP: PX13.5s		Page 2
<i>Culot</i> PX13.5s selon la CEI 61-1 (feuille 7004-35-). <i>Ampoule</i> Incolore ou jaune-sélectif. <i>Axe de référence</i> L'axe de référence est perpendiculaire au plan de référence et passe par l'intersection de ce plan avec l'axe de la collerette du culot . <i>Cap</i> PX13.5s in accordance with IEC 61-1 (sheet 7004-35-). <i>Bulb</i> Colourless or selective-yellow. <i>Reference axis</i> The reference axis is perpendicular to the reference plane and passes through the intersection of this plane with the axis of the cap ring.				
Caractéristiques et dimensions des lampes à filament Filament lamp characteristics and dimensions				
Caractéristiques Characteristics	Valeurs Values	Tolérances et valeurs limites Tolerances and limiting values		
		Lampes de fabrication Production lamps	Lampes étalon Standard lamps	
Tension nominale Nominal voltage	6 V	6 V	6 V	
Puissance assignée Rated wattage [W]	2,4	±8 %	±8 %	
Flux lumineux assigné Rated luminous flux [lm]	36	±15 %	1)	
Dimensions [mm]				
e	6,55	2)	±0,15	
f 4)	1,25	±0,35	±0,25	
h ₁	0,0	2)	±0,15	
h ₂	0,0	2)	±0,15	
β 3)	90°	±20°	±5°	
γ ₁ 5)	—	30° min.	30° min.	
γ ₂ 5)	—	25° min.	30° min.	

1) Flux lumineux d'essai 36 lm à environ 6,0 V.

2) A vérifier au moyen du système de contrôle de position («box system»), page 3.

3) L'axe du filament et le plan de la monture interne, par rapport à l'encoche de référence, doivent être situés à l'intérieur de la tolérance de l'angle β.

4) Les extrémités du filament sont définies par les intersections de l'extérieur de la première et de la dernière spire lumineuse ayant pratiquement l'angle d'enroulement correct avec l'axe du filament, vu de la direction ☉.

5) Dans l'aire comprise entre les parties extérieures des côtés des angles γ₁ et γ₂, l'ampoule ne doit comporter aucune surface présentant des distorsions optiques et le rayon de courbure de l'ampoule doit être égal ou supérieur à 50 % du diamètre réel de l'ampoule.

Note concernant le fonctionnement
Comme les lampes à filament aux halogènes fonctionnent à une température supérieure à celle des lampes conventionnelles, il est nécessaire de s'assurer qu'elles ne sont pas soumises à des tensions du générateur dépassant 8,0 V afin d'éviter une défaillance rapide.

1) Test luminous flux 36 lm at approximately 6,0 V.

2) To be checked by means of the location check system (box system), page 3.

3) Both the filament axis and the plane of the internal mount with regard to the reference notch shall lie within the tolerance of angle β.

4) The ends of the filament are defined by the intersections of the outside of the first and last light emitting turns having substantially the correct helix angle with the filament axis, seen from direction ☉.

4) In the area between the outer legs of the angles γ₁ and γ₂ the bulb shall have no optically distorting areas and the curvature of the bulb shall have a radius of not less than 50% of the actual bulb diameter.

Note regarding service operation
Because the filament of halogen lamps operates at higher temperatures than those of conventional lamps, it is necessary to ensure that these lamps are not subjected to generator voltages in excess of 8,0 V in order to avoid rapid failure.

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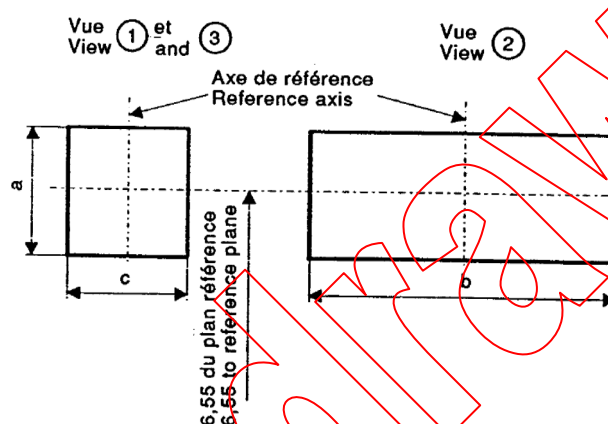
**LAMPES À FILAMENT
POUR VÉHICULES ROUTIERS
FEUILLE DE CARACTÉRISTIQUES
CATÉGORIE: HS3
CULOT: PX13.5s**

**ROAD VEHICLE
FILAMENT LAMP
DATA SHEET
CATEGORY: HS3
CAP: PX13.5s**

Page 3

Système de contrôle de la position du filament («box system») – (voir article A.10, annexe A)
Filament location check system (box system) – (see clause A.10, annex A)

Dimensions en millimètres - Dimensions in millimetres



Type	a	b	c
6 V	$d + 0,5$	2,1	1,1

d diamètre du filament.
d diameter of the filament.

La projection du filament dans les directions d'observation ①, ② et ③ doit se situer entièrement à l'intérieur des limites définies.

Si le filament, vu des directions ① et ③ est caché par les supports, ceux-ci en plus du filament doivent se trouver entièrement à l'intérieur de la dimension c.

The projection of the filament in viewing directions ①, ② and ③ shall lie completely within the limits defined.

If the filament is covered by the mounting parts seen from directions ① or ③, the mounting parts in addition to the filament shall lie completely within dimension c.

**LAMPES À FILAMENT
POUR VÉHICULES ROUTIERS
FEUILLE DE CARACTÉRISTIQUES
CATÉGORIE: B1.13W
CULOT: PX13.5s**

**ROAD VEHICLE
FILAMENT LAMP
DATA SHEET
CATEGORY: B1.13W
CAP: PX13.5s**

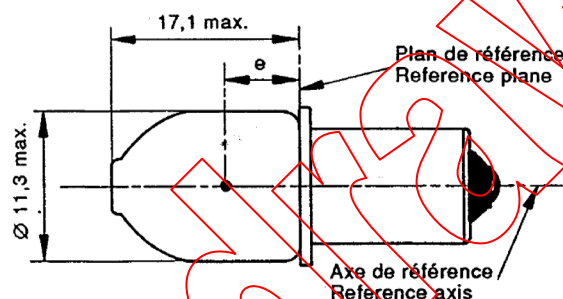
Tension nominale Nominal voltage	[V]	2,7
Puissance nominale Nominal wattage	[W]	1,13
Tension d'essai Test voltage	[V]	2,7

Dessin de la lampe à filament - Filament lamp drawing

Les dessins ont pour seul but d'illustrer les dimensions essentielles de la lampe à filament.

The drawings are intended only to illustrate the essential dimensions of the filament lamp.

Dimensions en millimètres - Dimensions in millimetres



Culot
PX13.5s selon la CEI 61-1 (feuille 7004-35-).

Ampoule
Ampoule incolore.

Cap
PX13.5s in accordance with IEC 61-1 (sheet 7004-35-).

Bulb
Bulb colourless.

**Caractéristiques et dimensions des lampes à filament
Filament lamp characteristics and dimensions**

Caractéristiques Characteristics	Valeurs Values	Tolérances et valeurs limites Tolerances and limiting values	
		Lampes de fabrication Production lamps	Lampes étalon Standard lamps
Puissance assignée Rated wattage [W]	1,13	±10 %	±10 %
Flux lumineux assigné Rated luminous flux [lm]	9,4	±20 %	1)
Dimensions [mm]			
e	6,35	±0,25	±0,15
Ecart latéral ²⁾ Lateral deviation ²⁾	0,0	max. 0,4	max. 0,2

1) Flux lumineux d'essai 9,4 lm à environ 2,7 V.

2) Ecart latéral du centre du filament par rapport à l'axe de référence.

1) Test luminous flux 9,4 lm at approximately 2,7 V.

2) Lateral deviation of filament centre from the reference axis.