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Economic Commission for Europe**Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Lighting and Light-Signalling****Ninety-first session**

Geneva, 22–25 October 2024

Item 5 of the provisional agenda

**UN Regulations on Light Sources and the Consolidated Resolution
on the Common Specification of Light Source Categories****Proposal for amendment 11 to the Consolidated Resolution
on the Common Specification of Light Source Categories****Submitted by the expert from the International Automotive Lighting
and Light-Signalling Expert Group***

The text reproduced below was prepared by the expert from the International Automotive Lighting and Light-Signalling Expert Group (GTB) with the aim to introduce new light emitting diode (LED) light source categories LW7A and LW7B in the Consolidated Resolution on the common specification of light source categories (R.E.5) (ECE/TRANS/WP.29/2016/111). There are no associated amendments to UN Regulations Nos. 37, 99 or 128. The modifications to the existing text of the Resolution are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2024 as outlined in proposed programme budget for 2024 (A/78/6 (Sect. 20), table 20.5), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



I. Proposal

The Status table, add a new row at the bottom to read:

"Status table

This consolidated version of this Resolution contains all provisions and amendments adopted so far by the World Forum for Harmonization of Vehicle Regulations (WP.29) and is valid from the date as indicated in the following table until the date on which the next revision of this Resolution becomes valid:

Version of the Resolution	Date * as from which the version is valid	Adopted by WP.29		Clarification
		Session No.	Amendment document No.	
1 (Original)	22.06.2017	170	ECE/TRANS/WP.29/2016/111	Based upon Annexes 1 of UN Regulations: <ul style="list-style-type: none"> No. 37, up to and including Supplement 44 No. 99, up to and including Supplement 11 No. 128, up to and including Supplement 5
...
[10]	[xx.xx.2025]	[xxx]	[ECE/TRANS/WP.29/2025/xx]	Introduction of new LED light source categories LW7A and LW7B

* This date is the date of adoption of the amendment to the Resolution by WP.29 or the date of entering into force of an amendment to Regulation No. 37, 99 or 128 adopted by AC.1 as a package with the amendment to the Resolution in the same session of WP.29.

Paragraph 3.3.,

Group 2, amend to read:

"

Group 2			
LED light source categories only for use in signalling lamps, cornering lamps, reversing lamps and rear registration plate lamps:			
	Category		Sheet number(s)
	LR1		LR1/1 to 5
	LW2	2	LW2/1 to 5
	LR3A		Lx3/1 to 6
	LR3B		Lx3/1 to 6
	LW3A	2	Lx3/1 to 6
	LW3B	2	Lx3/1 to 6
	LY3A		Lx3/1 to 6
	LY3B		Lx3/1 to 6
	LR4A		LR4/1 to 5
	LR4B		LR4/1 to 5
	LR5A		Lx5/1 to 6
	LR5B		Lx5/1 to 6
	LW5A	2	Lx5/1 to 6
	LW5B	2	Lx5/1 to 6
	LY5A		Lx5/1 to 6
	LY5B		Lx5/1 to 6
	LR6A		Lx6/1 to 6
	LR6B		Lx6/1 to 6

<i>Group 2</i>			
<i>LED light source categories only for use in signalling lamps, cornering lamps, reversing lamps and rear registration plate lamps:</i>			
	<i>Category</i>		<i>Sheet number(s)</i>
	LW6A	2	Lx6/1 to 6
	LW6B	2	Lx6/1 to 6
	LY6A		Lx6/1 to 6
	LY6B		Lx6/1 to 6
	LW7A	2	Lx7/1 to 6
	LW7B	2	Lx7/1 to 6

¹ Not for use in conformity of production control of lamps.

² Not for use behind red and amber lenses"

Annex 3,

List of sheets for LED light sources and their sequence, amend to read:

“

<i>Sheet number(s)</i>
C5W/LED/1 to 4
C5W_LED/1 to 4
H11/LED/1 to 7
H11_LED/1 to 7
L1/1 to 5
LR1/1 to 5
LW2/1 to 5
Lx3/1 to 6
LR4/1 to 5
Lx5/1 to 6
Lx6/1 to 6
Lx7/1 to 6
PY21W/LED/1 to 4
R5W/LED/1 to 4
W5W/LED/1 to 4

”

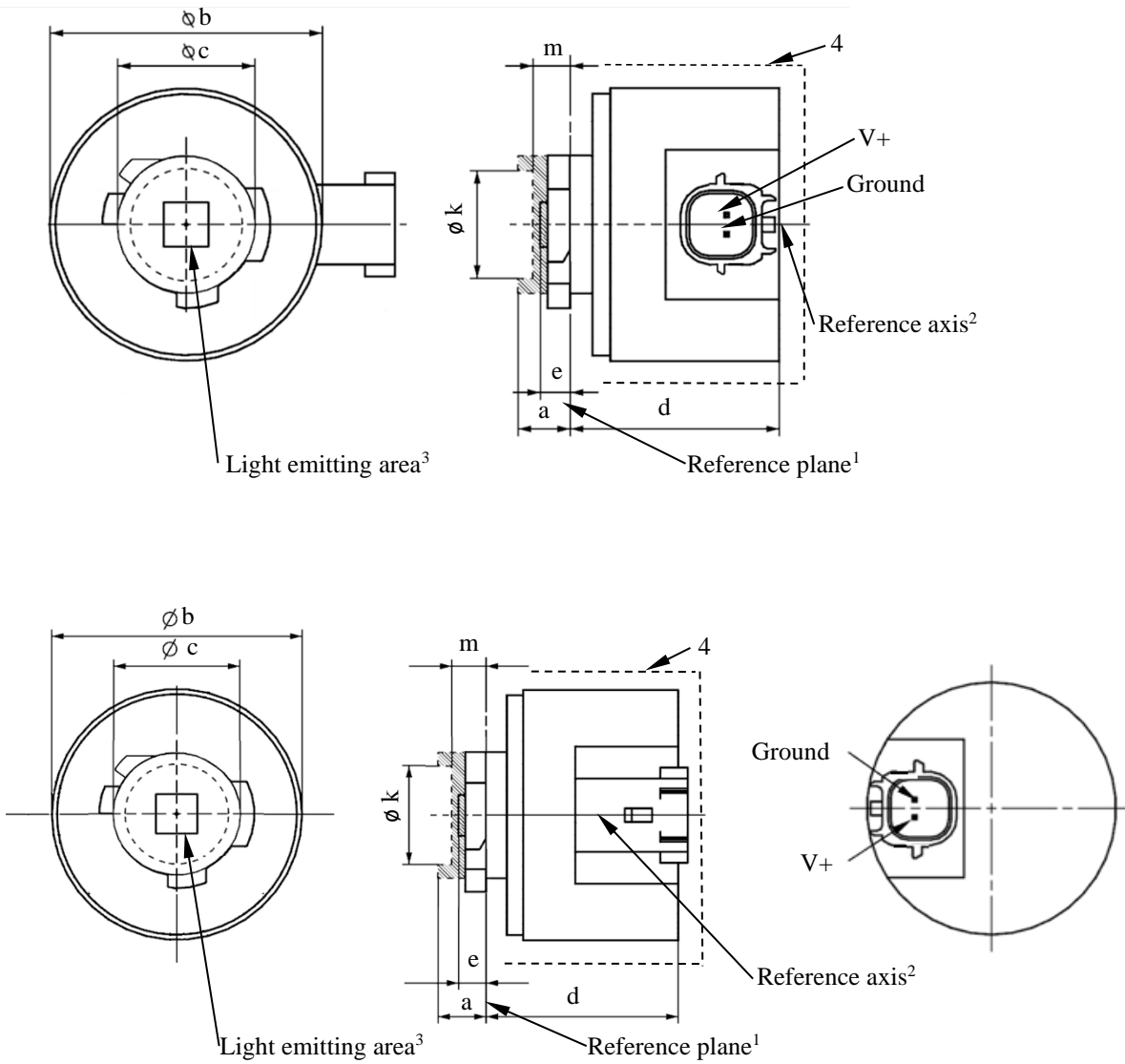
After sheet Lx6/6, insert new sheets Lx7/1 to 6, to read (see the following pages; one page per sheet):

The drawings are intended only to illustrate the essential dimensions of the LED light source.

Figure 1*

Main Drawing

LW7A



LW7B

* Projection method:

For the notes see sheet Lx7/2

Categories LW7A, LW7B

Sheet Lx7/2

Table 1
Essential dimensional, electrical and photometric characteristics of the LED light source

Dimensions		Production LED light sources	Standard LED light sources
a	mm	6.0 max.	
b	mm	c + 10.0 min. 38.0 max.	
c	mm	18.5 ± 0.1	
d	mm	28.0 max.	
e ^{8/}	mm	3.0 ± 0.30	3.0 ± 0.15
k ^{9/}	mm	7.5 min.	
m ^{9/}	mm	4.0 max.	
Cap LW7A, LW7B PGJ18.5d-36 in accordance with IEC Publication 60061 (sheet 7004-185-3)			
<i>Electrical and photometric characteristics</i>			
Rated values	Volts	12	
	Watts LW7A, LW7B	8	
Test voltage	Volts (DC)	13.5	
Objective Values ⁶	Watts (at test voltage) LW7A, LW7B	9 max.	
	Luminous flux (in lm at test voltage) ⁵ LW7A, LW7B	750 ± 20%	750 ± 10% ⁷
	Luminous flux (in lm at 9 V DC) ⁵ LW7A, LW7B	150 min.	

^{1/} The reference plane is the plane defined by the contact points of the cap-holder fit.

^{2/} The reference axis is perpendicular to the reference plane and passing through the centre of the bayonet core.

^{3/} Light emitting area: to be checked by means of the box system in Figure 2

^{4/} A minimum free air space of 5 mm around the light source shall be respected for convection; the connector interface can be neglected.

^{5/} The emitted light shall be white for LW7A and LW7B

^{6/} After continuous operation for 30 minutes at 23 ± 2.5° C.

^{7/} The measured value shall be in between 105 per cent and 90 per cent of the value measured after 1 minute.

^{8/} Light centre length; for the method of measurement, see Annex K of IEC 60809, Edition 4.

^{9/} The bounded area defined with the dimensions c, k and m defines the maximum outline in relation to the reference system

Electrical characteristics

In case of LED light source failure (no light emitted) the max. electrical current draw, when operated between 12 V and 14 V, shall be less than 20 mA (open circuit condition).

Screen projection requirements

The following test is intended to define the requirements for the light emitting area of the LED light source and to determine whether the light emitting area is correctly positioned relative to the reference axis and reference plane in order to check compliance with the requirements.

The position of the light emitting area is checked by the box system defined in Figure 2, which is aligned to the planes C₉₀ and C₁₈₀ and shows the projection when viewing along direction $\gamma = 0^\circ$ at $e = 3.0$ mm (C, γ as defined in Figure 3). The luminous flux Φ emitted into the viewing direction shall be calculated as given below:

$$\Phi = L \cdot S \cdot \Omega$$

with

S = area to be considered

L = luminance average of area S

Ω = solid angle defined by the entrance aperture of the measurement system

The distribution of luminous flux originating from the LEA as shown in Figure 2 shall fulfil the requirements given in Table 3. All numbers shall be given in % of the total luminous flux emitted into the viewing direction from the bayonet core area, i.e. a circular area with diameter $c = 18.5$ mm (see Figure 1).

Note: When evaluating the luminous flux distribution emitted from the LEA, reflections and stray light within the measurement equipment shall be reduced as much as possible and if necessary, corrected. More details regarding measurement of light-emitting areas can be found in the publication describing general photometry accuracy guidelines currently prepared by CIE TC2-67

Figure 2

Box definition of the light emitting area with dimensions as specified in Table 2

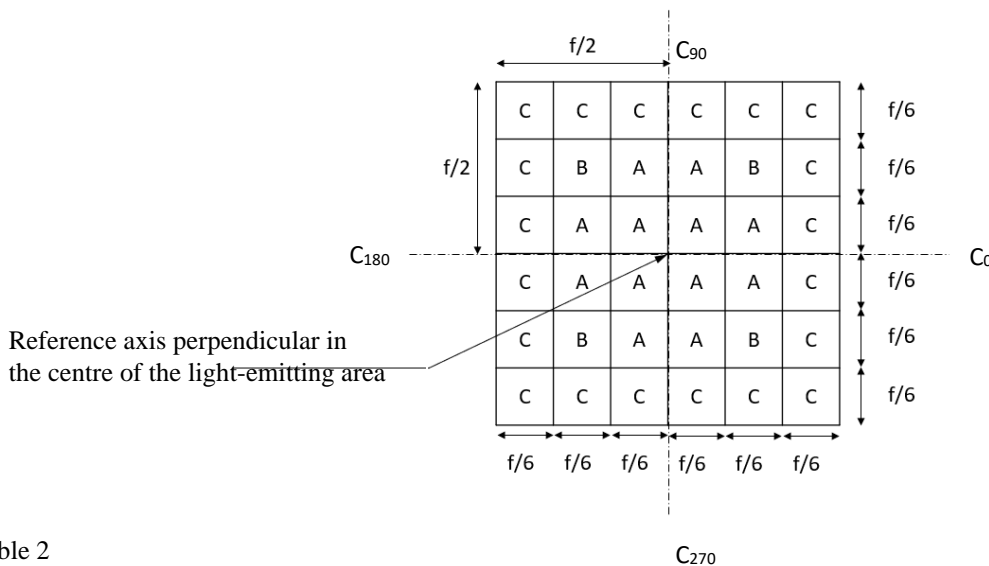


Table 2

Dimensions of the box system in Figure 2

Dimensions in mm	f
LED light sources of normal production	4.8
Standard LED light sources	4.8

CATEGORIES LW7A, LW7B

Sheet Lx7/4

Table 3

Proportion of the total luminous flux emitted into the viewing direction from the areas specified in Figure 2

<i>Category</i>	<i>Area(s)</i>	<i>LED light sources of normal production</i>	<i>Standard LED light sources</i>
LW7A, LW7B	Each A individually	> 3% < 10 %	> 3% < 10%
	Each B individually	> 3% < 10%	> 3% < 10%
	All A and B together	> 65%	> 70%
	Each C individually	< 3%	< 3%
	All A, B and C together	> 90%	> 90%

Normalized luminous intensity distribution

The following test is intended to determine the normalized luminous intensity distribution of the light source in an arbitrary plane containing the reference axis. The intersection of the reference axis and the parallel plane to the reference plane in distance $e = 3.0 \text{ mm}$ is used as the coordinate system origin.

The light source is mounted on a flat plate with the corresponding mounting lug features. The plate is mounted to the goniometer table by a bracket, so that the reference axis of the light source lines up with one of the rotating axes of the goniometer. The corresponding measurement set-up is described in Figure 3.

Luminous intensity data is recorded with a standard photo-goniometer. The measurement distance should be chosen appropriately, to make sure that the detector is located in the far field of the light distribution.

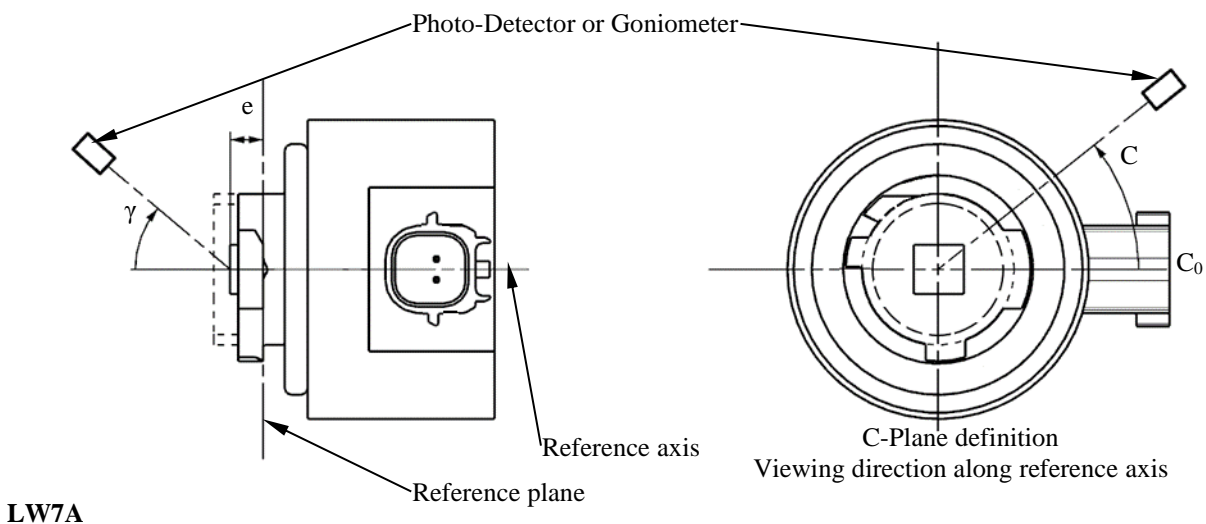
The measurements shall be performed in C-planes C_0 , C_{90} , C_{180} and C_{270} , which contain the reference axis of the light source. The test points for each plane for multiple polar angles γ are specified in Table 4.

The measured luminous intensity values, normalised to the measured luminous flux of the individual light source under test, shall be converted to normalised luminous intensity values of a 1,000 lm light source. The data shall comply with the tolerance band as defined in Table 4.

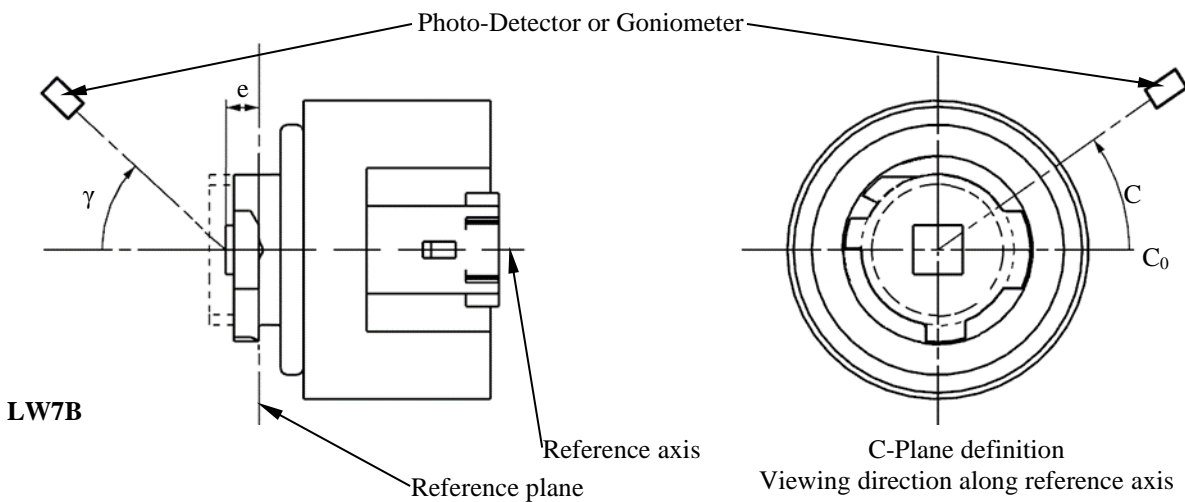
The drawings are intended only to illustrate the essential set-up for measurement of the LED light source.

Figure 3

Set-up to measure the luminous intensity distribution



LW7A



LW7B

Categories LW7A, LW7B

Sheet Lx7/6

The light pattern as described in Table 4 shall be substantially uniform, i.e. in between two adjacent grid points the relative luminous intensity requirement is calculated by linear interpolation using the two adjacent grid points. In case of doubt this may be checked in addition to verification of the grid points given in Table 4.

Table 4

Test point values of normalized intensities

<i>Angle γ</i>	<i>LED light sources of normal production</i>		<i>Standard LED light sources</i>	
	<i>Minimum Intensity in cd /1000 lm</i>	<i>Maximum Intensity in cd/1000 lm</i>	<i>Minimum Intensity in cd /1000 lm</i>	<i>Maximum Intensity in cd /1000 lm</i>
0°	200	425	250	390
15°	190	415	240	370
30°	170	380	220	335
45°	145	310	180	275
60°	85	245	105	220
75°	0	160	0	150
90°	0	70	0	65

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II. Justification

1. This proposal introduces new LED light source categories for signalling to accommodate an increasing market demand for LED light sources according to UN Regulation No. 128. The ongoing trends towards style-driven daytime running lamps (DRL) lamps and high-performance reversing lamps require light sources with higher luminous output to compensate the lower efficiency of the corresponding optical designs.
 2. In general, standardized and replaceable UN Regulation No. 128 LED light sources can serve individual signalling lamp designs with limited development efforts. The proposed categories of a high luminous flux mono-function white light source are based on an established cap concept with an increased and more precise light output, applying the same future-proof specification of the light emitting area (LEA), that has been introduced for the LR6/LW6/LY6 family of categories.
 3. The cap/holder system for the new white emitting light source is based on the International Electrotechnical Commission (IEC) PGJ18.5d fit, a family of cap/holders that has already been successfully employed in existing LED light sources in UN Regulation No.128. Keys from the PGJ18.5d fit that are not in use so far have been assigned to the newly proposed categories. Following established LED light source categories, the new white emitting light source is proposed with an elbow connector at the side – the A version – as well as with a straight connector at the bottom – the B version. The assigned category designations are LW7A and LW7B respectively.
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