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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****Eightieth session**

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Item 5 of the provisional agenda

UN Regulations Nos. 37 (Filament lamps), 99 (Gas discharge light sources), 128 (Light emitting diodes light sources) and the Consolidated Resolution on the common specification of light source categories**Proposal for Supplement [9] to the original version of Regulation No. 128 (Light emitting diodes light sources)****Submitted by the Task Force on Substitutes and Retrofits (TF SR)***

The text reproduced below was prepared by the Task Force on Substitutes and Retrofits (TF SR) as a revision of the proposal prepared by the expert from the International Automotive Lighting and Light Signalling Expert Group (GTB) which introduces requirements and test specifications for light emitting diodes (LED) substitute light sources. This proposal is an updated version of ECE/TRANS/WP.29/GRE/2017/21, considered by the Working Party on Lighting and Light-Signalling (GRE) at its seventy-eighth session, and takes into account comments received from several Contracting Parties. The comments made during the seventy-ninth session of GRE have also been taken into account, as well as the draft amendments in ECE/TRANS/WP.29/2018/30 and ECE/TRANS/WP.29/GRE/2018/21. The modifications to the existing text of the UN Regulation are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2018–2019 (ECE/TRANS/274, para. 123 and ECE/TRANS/2018/21/Add.1, cluster 3.1), 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

GE.18-13129(E)



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I. Proposal

Insert a new paragraph 2.2.2.4., to read:

- "2.2.2.4. Documents, in case of LED substitute light sources, showing:**
- (a) The information to be displayed on; and**
 - (b) The instructions to be contained by the packaging of LED substitute light sources."**

Insert a new paragraph 2.3.1.5., to read:

- "2.3.1.5. In the case of LED substitute light sources, the following symbol¹:**



Insert a new paragraph 3.12., to read:

- "3.12. LED substitute light sources - additional requirements**
- 3.12.1. The electrical current of the LED substitute light source shall be measured at ambient temperature of (23 ± 2) °C in still air after 1 minute and after 30 minutes of operation at test voltage.**
- Measured values of the electrical current shall be within the limits as specified in the relevant data sheet of Annex 1.**
- 3.12.2. The LED substitute light source shall comply with the technical requirements to an electrical/electronic sub-assembly (ESA) as specified by Regulation No. 10 and its series of amendments in force at the time of application for type approval.**
- 3.12.3. The LED substitute light source shall not emit light when activated for 2 milliseconds or shorter.**
- 3.12.4. The correlated colour temperature² of LED substitute light sources emitting white light shall be no more than 3000 K, unless an appropriate keying is defined in the relevant data sheet of Annex 1 for light sources with a specified higher correlated colour temperature.**
- 3.12.5. An LED substitute light source shall be equipped with a cap to prevent mis-use in service, meeting the requirements as defined in the relevant data sheet of Annex 1. This shall be verified by the technical service. "**

Insert a new paragraph 4, to read:

"4. Requirements to the packaging of LED substitute light sources

- 4.1. Each package shall display the following information:**

¹ ISO 7000, symbol 1641

² CIE S 017/E: 2011: ILV: International Lighting Vocabulary, or eILV; term 17-258

- 4.1.1. The trade name or mark of the manufacturer;
- 4.1.2. The rated voltage;
- 4.1.3. The designation of the LED substitute light source category;
- 4.1.4. The approval code;
- 4.1.5. The following symbol³:



- 4.2. Each package shall contain instructions in an official language of the 1958 Agreement (i.e. English, French or Russian), supplemented by the corresponding text in the language of the country where it is sold:
 - 4.2.1. Stating that this LED substitute light source is suitable for fitment in lamps on vehicle models if both the lamp and the vehicle in which it is to be installed are approved for the use of this LED substitute light source;
 - 4.2.2. Providing (a) website address(es) where the LED light source manufacturer shall publish up-to-date listing(s) of light signalling functions installed on vehicle models, specified by at least brand, type, model, and manufacturing period of the vehicle, approved for the use of the LED substitute light source;
 - 4.2.3. Referring to the lamp markings and instructions provided with the vehicle;
 - 4.2.4. Referring to professional maintenance or repair shops, if the applicability of the LED substitute light source is unclear;
 - 4.2.5. Warning, clearly legible, that if this LED substitute light source is not used in accordance with the instructions with its package and with the instructions provided with the vehicle, this LED substitute light source may cause a fault in the vehicle's electrical system and/or pose an operational and/or traffic safety risk.
- 4.3. The manufacturer shall provide the instructions, as referred to in paragraph 4.2, for displaying purposes at the point of sales without opening the package."

Former paragraphs 4 to 7, subparagraphs and references therein, renumber as paragraphs 5 to 8, their respective subparagraphs and references.

Former paragraph 4.1., renumber as a new paragraph 5.1. and amend to read:

- "4.5.1. LED light sources approved to this Regulation shall be so manufactured as to conform to the type approved by meeting the inscriptions and technical requirements set forth in paragraph 3. ~~above~~ and Annexes 1, 4 and 5 to this Regulation.

³ ISO 7000, symbol 1641

In addition, the information on the packages and the instructions of LED substitute light sources contained by the packages shall conform to the requirements as set forth in paragraph 4."

New paragraph 5, insert a new paragraph 5.3.7. to read:

"5.3.7. Keep record of the listings, including the modifications and modification dates, published on its websites as described in paragraph 4.2.2."

Annex 4, introductory part, amend to read:

"LED light sources of all categories with integrated ~~heatsink~~ **heat sink** shall be measured **in still air** at ambient temperature of $(23 \pm 2) ^\circ\text{C}$ ~~in still air~~, **and at an additional ambient temperature if indicated in the relevant data sheet of Annex 1**. For these measurements the minimum free air space as defined in the data sheets shall be maintained.

LED light sources of all categories with definition of a temperature T_b shall be measured by stabilising the T_b -point at the specific temperature defined on the category data sheet..."

Annex 5, paragraph 1., amend to read:

"1. General

The conformity requirements shall be considered satisfied from a photometric, geometrical, visual and electrical standpoint if the specified tolerances for production LED light sources in the relevant data sheet of Annex 1, ~~and the relevant data sheet for the caps~~ **and in the case of LED substitute light sources the additional requirements to LED substitute light sources in paragraph 3.12.** are met."

Annex 6, table 1, insert an additional row at the bottom, to read:

"Table 1
Characteristics

<i>Grouping of characteristics</i>	<i>Grouping* of test records between LED light source types</i>	<i>Minimum 12 monthly sample per grouping*</i>	<i>Acceptable level of non-compliance per grouping of characteristics (%)</i>
Marking, legibility and durability	All types with the same external dimensions	315	1
External LED light source dimensions (excluding cap/base)	All types of the same category	200	1
Dimensions of caps and bases	All types of the same category	200	6.5
Dimensions related to light emitting surface and internal elements**	All LED light sources of one type	200	6.5
Initial readings, power, colour and luminous flux**	All LED light sources of one type	200	1
Normalised luminous intensity or cumulative luminous flux distribution	All LED light sources of one type	20	6.5
Electrical current***	All LED light sources of one type	20	1

* The assessment shall in general cover series production LED light sources from individual factories. A manufacturer may group together records concerning the same type from several factories, provided these operate under the same quality system and quality management.

** In case a LED light source has more than one light output function the grouping of characteristics (dimensions, power, colour and luminous flux) applies to each element separately.

** LED substitute light sources only"

II. Justification

1. This proposal was originally developed and submitted by GTB to the seventy-seventh and seventy-eighth sessions of GRE. It has been considered by the GRE Task Force Substitutes and Retrofits (TF SR), As a result, amendments are proposed by TF SR. Comments from the preceding meetings of GRE have been taken into account. A cap-interlock-feature was introduced to prevent misuse.
 2. The proposal for the light source comprises of (amendments to):
 - (a) A draft proposal to introduce provisions into UN Regulation No. 128;
 - (b) A draft proposal to introduce a new category sheet PY21W/LED based on LED technology into the Consolidated Resolution (R.E.5);
 - (c) Equivalence criteria as guidance for specifying sheets for LED substitute light source categories (informal document GRE-80-02). These guidelines are intended for publication, with the agreement of GRE, on the GRE website under "reference documents", similar to criteria for new filament light sources for head lighting (GRE-77-04). In addition, these criteria are being prepared for insertion in the publication of the International Electrotechnical Commission, IEC 60810;
 - (d) A draft proposal to IEC concerning the cap/holder system of the LED light source category PY21W/LED, for information to GRE (GRE-80-03) only, to show the interlock feature and the differences with the cap/holder system of its counterpart filament light source category PY21W.
 3. This document is amending the original proposal from GTB (ECE/TRANS/WP.29/GRE/2017/21) in relation to:
 - (a) Comments made during the preceding sessions of GRE;
 - (b) ECE/TRANS/WP.29/2018/30 concerning proposals for the introduction of LED light sources for forward lighting, resulting in editorial amendments to this proposal;
 - (c) ECE/TRANS/WP.29/GRE/2017/21 concerning the approval code and approval mark, resulting in editorial amendments to this proposal;
 - (d) The requirements for the relevant packaging;
 - (e) Rearrangement of the sequence of subparagraphs in 4.2.;
 - (f) The description and wording of "websites".
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