Comments from Germany on ECE/TRANS/WP.29/GRE/2017/2

 **General remarks to all documents dealing with the item “LED substitute light sources”**

**From our point of view, as mentioned by UK, at first the fundamental questions need to be discussed:**

**- Do we want to make LED substitute light sources legal, which are able due to their construction to replace filament light sources in existing approved lamps?**

**If the answer of GRE is Yes:**

**- The political aspects need to be discussed, because this will influence not only typ-approval and CoP but also Periodical Technical Inspection, Technical Roadside Inspection and inspections by Police and other authorities.**

**- For that purpose we need a clear identification of the approved lamps where the installation of LED substitute light sources is legal.**

 I. Proposal – Comments from Germany in yellow

*Amend the new paragraph 2.1.2.4., to read:*

“**2.1.2.4. The correlated\* colour temperature, in so far as it concerns white LED ~~substitute~~ light sources;**

**LED ~~substitute~~ light sources of the colour white with a correlated colour temperature exceeding 3000 K or not exceeding 3000 K are considered as being of different types.**

**\* CIE S 017/E: 2011: ILV: International Lighting Vocabulary, or** [**eILV**](http://eilv.cie.co.at/term/258)**; term 17-258.**“

*Paragraph 2.2.2.2.,* amendto read:

“2.2.2.2. A brief technical description **including the correlated colour temperature of the light emitted in case of a LED substitute light source emitting white light;**”

*Insert a new paragraph 2.3.1.5*., to read:

**“2.3.1.5. The marking as indicated in paragraph 2.3.3., if applicable. “**

*Delete this new paragraph 2.3.3. and renumber the former paragraph 2.3.3.,* to read:

~~“2.3.3.~~ **~~LED substitute light sources of the colour white with a correlated colour temperature not exceeding 3000 K shall be marked by a “G”, placed after the LED substitute light source category marking separated by a space.~~**

**2.3.4.** Inscriptions other than those covered by paragraphs 2.3.1.**, 2.3.3.** and 2.4.4. may be affixed, on the condition that they do not adversely affect the luminous characteristics.”

*Insert a new paragraph 3.10.,* to read:

**“3.10. LED substitute light sources - additional requirements**

**3.10.1. 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.** .

**3.10.2. 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.**

**3.10.3. The LED substitute light source shall not emit light when activated for 2 milliseconds or shorter.”**

*Add a further paragraph:*

**3.10.4. Only such LED substitute light sources are allowed to be approved, which generate the same light performance in any lamp, which was approved with the filament lamp of the same [corresponding] category without any exception.**

**3.10.4.1. The applicant shall demonstrate to the Technical Service responsible for type approval with measurements, by a sufficient number of lamps of different technology (and different manufacturers), that the LED substitute light source generate the same light performance in [nearly all] [min. 80 %] [any] of the tested lamps.**

**3.10.4.2. The authority which granted approval shall have the right to check the performance of a LED substitute light source, equivalent to paragraph 3.10.4.1..**

*Annex 4, indroductory part,* amend to read:

“Light sources of all categories with integrated ~~heatsink~~ **heat sink** shall be measured **in still air** at ambient temperature of (23 ± 2) °C ~~in still air~~**,** **and at an additional ambient temperature if indicated in the relevant light source sheet.** For these measurements the minimum free space as defined in the data sheets shall be maintained.

Light sources of all categories with definition of a temperature Tb shall be measured by stabilising the Tb-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 3.10.** are met."

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

“Table 1

**Characteristics**

|  |  |  |  |
| --- | --- | --- | --- |
| *Grouping of characteristics* | *Grouping\* of test records between LED light source types* | *Minimum 12 monthly sample per grouping\** | *Acceptable level of non-compliance per grouping of characteristics (%)* |
| Marking, legibility and durability | All types with the same external dimensions | 315 | 1 |
| External LED light sourcedimensions (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

With regard to the comments of the expert of Germany the following principle is an important item:

**Fundamental Law of Replaceable Light Sources:

Replaceable light sources of the same category and the same cup-holder-system
shall generate in any lamp , which was approved with that category,
- the same lighting performance
- independently from the optical construction of the lamp and
- independently from the light source technology.**

**Therefore is a marking with “G” for general use not acceptable.**