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Working Party on Lighting and Light-Signalling

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Item 3(a) of the provisional agenda

REGULATION No. 37
(Filament lamps)

Proposal for Supplement 34 to the 03 series of amendments

Submitted by the expert from the Working Party "Brussels 1952" */

The text reproduced below was prepared by the expert from the Working Party "Brussels 1952" (GTB) in order to clarify and correct requirements for checking the colour of filament lamps. The proposal is based on the current text of the Regulation, including draft Supplement 33 to the 03 series of amendments to Regulation No. 37 (ECE/TRANS/WP.29/2009/18). The modifications to the existing text are marked in bold characters.

*/ In accordance with the programme of work of the Inland Transport Committee for 2006-2010 (ECE/TRANS/166/Add.1, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance performance of vehicles. The present document is submitted in conformity with that mandate.

A. PROPOSAL

Text of the regulation

Paragraph 3.6.3., amend to read:

"**3.6.3. The colour of the light emitted shall be measured by the method specified in Annex 5. Each measured value shall lie within the required tolerance area. 5/ 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 locus (IEC Publication 15.2 Colorimetry, 1986). Filament lamps for use in light signalling devices shall meet the requirements as specified in paragraph 2.4.2. of IEC Publication 60809, Amendment [5] to Edition 2.**

5/ For Conformity of Production purposes of amber and red colour only, at least 80 per cent of the measuring results shall lie within the required tolerance area."

Annex 2, item 9, amend to read:

"9. Concise description:

...

Colour of the light emitted: White/selective-yellow/amber/red 2/

Colour coating on glass bulb: yes/no 2/

Halogen filament lamp: yes/no 2/ "

Annex 5,

Paragraph 1.4., amend to read:

"1.4. Filament lamps shall be measured preferably in the normal operating position. **In case of dual filament lamps the high wattage (major or driving-beam) filament shall be operated only.**"

Paragraphs 2.3. to 2.3.3., amend to read:
(the drawing remains unchanged)

"2.3. Measuring directions (see the figure below).

2.3.1. Initially, the receiver shall be positioned perpendicular to the lamp axis and to the filament axis (or plane in case of a curved filament). After measurement the receiver shall be moved around the filament lamp in bi-directional steps of about 30° until the

area specified in paragraphs 2.3.2. or 2.3.3. is covered. In each position a measurement shall be made. However, no measurement shall be made when**:**

(a) **The** centreline of the receiver coincides with the filament axis**; or**

(b) **The line of sight between the receiver and the filament is blocked by opaque (non-transmitting) parts of the light source, such as lead wires or a second filament, if any.**

2.3.2. For filament lamps used in headlamps, measurements shall be made in directions around the filament lamp with the centreline of the receiver aperture located within an angle ± 30°, from the plane perpendicular to the lamp axis with the origin in the centre of the filament. In case of filament lamps with two filaments, the centre of the driving-beam filament shall be taken.

2.3.3 For filament lamps used in light signalling devices, measurements shall be made **in directions** around the filament lamp with exception of**:**

(a) the area claimed or covered by the cap of the filament lamp**; and**

(b) the immediate transition area **along the cap**.

In case of filament lamps with two filaments, the centre of the major filament shall be taken.

…"

"Annex 7,

Table 1, amend to read:

" Table 1 - Characteristics

Grouping of characteristics	Grouping */ of test records between lamp types	Minimum 12 monthly sample per grouping */	Acceptable level of non-compliance per grouping of characteristics (%)
...			
Colour of the bulb	All **types (emitting red and amber light**) **of the same category and colour technology**	**20**	1
...			
Colour endurance test	**All lamps (emitting red, amber and white light)** of one **colour** coating technology	20 ***/	1

...

***/ Representative distribution over categories of lamps using the same colour coating technology and finishing, and that comprises lamps of the smallest and the largest diameter of the outer bulb, each at the highest rated wattage. "

Table 2, amend to read:

"

Table 2 ***/**

Number of test results of each characteristics	Qualifying limits for acceptance
20	**0**
21 - 50	**1**
51 - 80	**2**
81 - 125	**3**
126 - 200	**5**
201 - 260	6
261 - 315	7
316 - 370	8
371 - 435	9
436 - 500	10
501 - 570	11
571 - 645	12
646 - 720	13
721 - 800	14
801 - 860	15
861 - 920	16
921 - 990	17
991 - 1,060	18
1,061 - 1,125	19
1,126 - 1,190	20
1,191 - 1,249	21

***/ In accordance with ISO 2859-1:1999 "Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection" including Technical Corrigendum 1:2001.**"

B. JUSTIFICATION

This proposal is to clarify and correct requirements for checking the colour of filament lamps (known as "colour spread test" and "colour endurance test").

Tests for checking the colour of filament lamps in Regulation No. 37 are quite extensive, in particular in the case of COP. To reduce the number of test samples for checking COP of the

colour of the bulb (colour spread test), Regulation No. 37 allows to group test records of "all coloured bulbs of the same design". However, there is no specification of "... the same design". To avoid different interpretations, it is proposed to sample per category and colour technology at the same amount as for the colour endurance test in the case of COP. On this occasion, also an omission for the number of test results below 200 is introduced/corrected.

The colour endurance test was introduced in IEC60809 Amendment 3 to Edition 2, 2004-05, and was based on the earlier so-called FAKRA test. ECE Regulation No.37 requires this colour endurance test by reference since Amendment 3 to Revision 3 (Supplement 23) of Regulation No.37, in force since 26 February 2004.

This proposal is to revise provisions that seem to be interpreted in practice in different ways. That is leading to unequal treatment, while this test is very demanding.

The corresponding proposal to amend IEC60809 is attached below for information.

C. INFORMATION

Proposal to IEC

COLOUR ENDURANCE TEST

IEC60809

Introductory note (not part of the proposal)
The colour endurance test was introduced in IEC60809 Amendment 3 to Edition 2, 2004-05, and was based on the earlier so-called FAKRA test.
Regulation No. 37 requires the colour endurance test since Amendment 3 to Revision 3 (Supplement 23) of Regulation No. 37 entered into force 26 February 2004.

This proposal is to revise provisions that seem to be interpreted in different ways. Apart from unequal treatment, it also caused unnecessary workload while this test is very demanding already.

Items:
Coloured vs. colour coated
80 per cent of measuring results in COP
Calibrated while empty
Dual filament lamps
Measuring directions

Sub clause 2.4.1., last paragraph, replace by:

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

Sub clause 2.4.2., replace by:

2.4.2. Colour endurance

~~Coloured~~ Filament lamps for use in light signalling devices shall be operated under test conditions for colour endurance measurements as specified in annex K.

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 per cent of the measuring results for conformity of production purposes, shall be within the limits specified in 2.4.1.

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 K shall no longer be used in light signalling devices and are to be considered end of life for that purpose.

Sub clause B.1, replace by:

B.1 General

Measurements shall be made on finished lamps. Filament lamps with secondary (outer) bulb acting as colour filter shall be handled as filament lamp with primary bulb.

Tests shall be made at an ambient temperature of 23 °C ± 5 °C.

Tests shall be made at test voltage as specified in the relevant filament lamp data sheet.

Filament lamps shall be measured preferably in the normal operating position. In case of dual filament lamps the high wattage (major or driving-beam) filament shall be operated only.

Before starting a test, the stabilization of the temperature of the filament lamp shall be obtained by operating at test voltage for 10 min.

Sub clause B.3, the text, replace by:
(Figure B.1 and Figure B.2 remain unchanged)

B.3 Measuring directions

B.3.1 General

Initially, the receiver shall be positioned perpendicular to the lamp axis and to the filament axis (or plane in case of a curved filament). After measurement the receiver shall be moved around the filament lamp in bi-directional steps of about 30° until the area specified in B.3.2 or B.3.3 is covered. In each position a measurement shall be made. However, no measurement shall be made when:

The centreline of the receiver coincides with the filament axis; or

The line of sight between the receiver and the filament is blocked by opaque (non-transmit tent) parts of the light source, such as lead wires or a second filament, if any.

B.3.2 Filament lamps used in headlamps

Measurements shall be made in directions around the filament lamp with the centreline of the receiver aperture located within an angle ± 30° from the plane perpendicular to the lamp axis and with the origin in the centre of the filament (see Figure B.1). In case of filament lamps with two filaments, the centre of the driving-beam filament shall be taken.

B.3.3 Filament lamps used in light signalling devices

Measurements shall be made ~~randomly~~ in directions around the filament lamp (see figure B.2), with exception of:
the area claimed or covered by the cap of the filament lamp; ~~, including~~ or
the immediate transition area along the cap ~~(see Figure B.2)~~.
In case of filament lamps with two filaments, the centre of the major filament shall be taken.

Sub clause K.1 first sentence, replace by

K.1 General
The test conditions for colour endurance measurements shall apply to ~~coloured~~ filament lamps for use in light signalling devices.

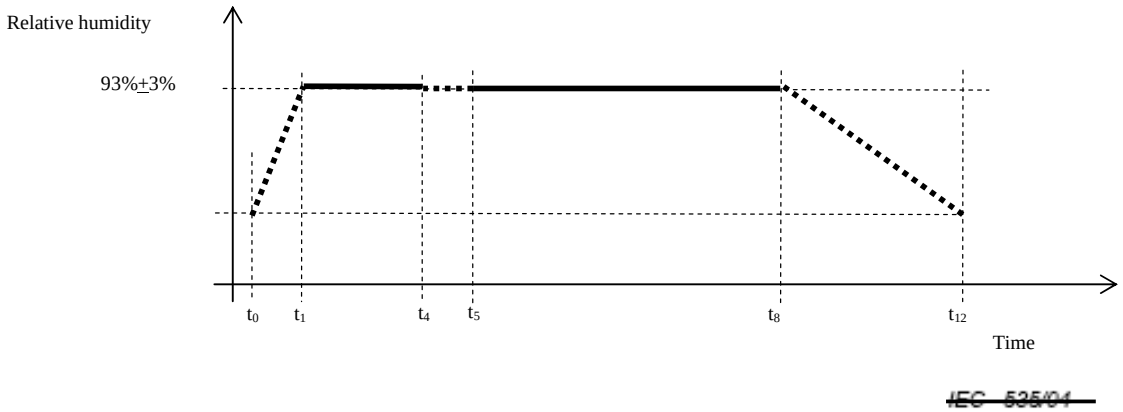
Sub clause K.1 Table K.1.b, replace by

Table K.1.b. – Applicable boxes of the test racks

Filament lamps' maximum wattage [a]					Applicable box in Table K.2.
>	0W	and	≤	10W	A
>	10W	and	≤	20W	B
>	20W	and	≤	30W	C
>	30W	and	≤	45W	D
[a] Wattage – ~~when operating~~ at test voltage; – of the higher wattage (major or driving-beam) filament in case of dual filament lamps ~~when both filaments are operated simultaneously~~. (IEC60809: rated wattage; ECE/R37: objective value of wattage);					

Sub clause K.2, replace by:
"K.2 Calibration and ageing
The climate chamber shall be calibrated while empty and before filament lamps on test racks are placed in the climate chamber.
Filament lamps shall be aged at their test voltage for 60 min ± 5 min. For dual filament lamps~~, each~~ only the major filament shall be aged ~~separately~~. Filament lamps which fail during the ageing period shall be replaced and the ageing process re-applied."

Figure K4, replace by:
(delete – – – from the key to the symbols and replace in the curve between t_5 and t_8 by ———)



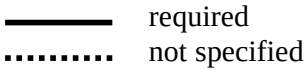


Figure K.4 - Relative humidity in the climate chamber during one operating cycle

Sub clause K.7, replace by:

K.7 Closure
Filament lamps shall be held at rest, switched off, at a room temperature of 23 °C ± 2 °C for at least 2 h after the end of the 10 operating cycles and shall no longer be used in light signalling devices but to be considered end of life for that purpose.

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