

Proposal for updating the reference to IEC 60809 in GRE/2021/13 (R148.01) and GRE/2021/14 (R149.01)

This informal document is based on discussion in the IWG SLR, where it was agreed that IEC should prepare a proposal for updating the references to IEC 60809 Edition 4 in the proposals for R148.01 and R149.01.

A Proposal for amending document GRE/2021/13 for UN Regulation No. 148.01 (Light Signalling Devices)

Amend paragraph 3.1.2.5. to read:

“3.1.2.5. In the case of lamps equipped with non-replaceable filament light source(s) or light source module(s) equipped with non-replaceable filament light source(s), a report, acceptable to the Authority responsible for type approval, that demonstrates compliance of these non-replaceable filament light source(s) with the requirements as specified in paragraph 4.11 of IEC 60809, **Edition 4.**”

Amend paragraph 6.3. to read:

“6.3. In the case where doubt exists in respect to compliance of the non-replaceable filament light source(s) with lifetime requirements and/or, in the case of colour coated filament light sources, with colour endurance requirements, as specified in paragraph 4.11 of IEC 60809, **Edition 4**, conformity shall be checked as specified in paragraph 4.11 of IEC 60809, **Edition 4.**”

B. Proposal for amending document GRE/2021/14 for UN Regulation No. 149.01 (Road Illumination Devices)

Amend paragraph 4.5.2.5. to read:

“4.5.2.5. In the case of ~~cornering~~ lamps equipped with non-replaceable filament light source(s) or light source module(s) equipped with non-replaceable filament light source(s), the applicant shall annex to the type approval documentation a report, acceptable to the Authority responsible for type approval, that demonstrates compliance of these non-replaceable filament light source(s) with the requirements as specified in paragraph 4.11 of IEC 60809, **Edition 4.**”

Amend paragraph 6.1.9.2. to read:

“6.1.9.2. in the case where doubt exists in respect to compliance of the non-replaceable filament light source(s) with lifetime requirements and/or, in the case of colour coated filament light sources, with colour endurance requirements, as specified in paragraph 4.11 of IEC 60809, **Edition 4**, conformity shall be checked as specified in paragraph 4.11 of IEC 60809, **Edition 4.**”

II. Justification

Part A:

The IEC standard 60809 was updated in April 2021 from Edition 3 to Edition 4. In Annex 1 and Annex 2 the referenced clause 4.11 (Ed 3 and Ed 4) is shown. The Table 1 in Ed 4 was updated to now refer to both the “old” device regulations and also the “new” Light Signalling Device Regulation 148 (see blue highlight frame in Annex 2).

It is proposed to refer to the Edition 4 of IEC 60809 in the R148.01.

Part B:

The IEC standard 60809 was updated in April 2021 from Edition 3 to Edition 4. In Annex 1 and Annex 2 the referenced clause 4.11 (Ed 3 and Ed 4) is shown.

The Table 1 in Ed 4 was updated to now refer to both the “old” device regulations and also the “new” Road Illumination Device Regulation 149. In addition, and following the approach of R149.01, where now all functions allow the use of non-replaceable filament light sources, the Table 1 was extended to cover also the “missing” functions such as passing beam and driving beam headlamps (see red highlight frame in Annex 2).

Consequently, it is appropriate to delete the word “cornering” and to refer to the Edition 4 of IEC 60809 in the R149.01.

Annex 1: IEC 60809 Ed3 Clause 4.11

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 °C ± 5 °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.

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.

Annex 2: IEC 60809 Ed4 Clause 4.11

4.11 Non-replaceable filament lamps

4.11.1 General

Subclause 4.11 and its subclauses apply to non-replaceable filament lamps and in addition these subclauses can be applied to non-replaceable light sources based on other technologies.

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 relating to:

- lifetime;
- colour and colour endurance;
- luminous flux maintenance factor 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 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 lifetime requirements specified in 4.11.3 and for colour coated filament lamps also with colour endurance requirements 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 that are fixed firmly and securely with the appropriate means necessary to conduct the test or as specified by the respective test, shall be used. 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. In case non-replaceable filament lamps are part of replaceable modules, the life B10 shall not be less than 50 % of the value given in Table 1.

Table 1 – Lifetime of non-replaceable light sources used in devices (luminaires)

Light sources used in the following lighting function	Life B10 ^a h	Corresponding UN Regulations (for information only)
Rear registration plate lamps	2 200 ^b	No. 4 and No. 148
Direction indicator lamps	500	No. 6, 50 and No. 148
Front and rear position lamps	2 200 ^b	No. 7, 50 and No. 148
Stop lamps	1 000	No. 7, 50 and No. 148
End-outline marker lamps	2 200	No. 7 and No. 148
Reversing lamps	100	No. 23 and No. 148
Rear fog lamps	100	No. 38 and No. 148
Parking lamps	2 200	No. 77 and No. 148
Daytime running lamps	4 000	No. 87 and No. 148
Side marker lamps	2 200 ^b	No. 91 and No. 148
Cornering lamps	200	No. 119 and No. 149
Passing beam headlamp	2 000	No. 149
Bend lighting	100	No. 149
Driving beam headlamp	200	No. 149
Adaptive driving beam	800	No. 149
Front fog lamp	100	No. 149

^a 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.

^b 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 specified in Annex A of IEC 60810:2017.

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

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 factor 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 factor 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 data sheet 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 that is used for the specified device shall be taken into consideration.

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 60810:2017 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 60810:2017 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 two.