Texte zu den geplanten neuen EU-Regelungen zur umweltgerechten Produktgestaltung und zur Energieverbrauchskennzeichnung in der Beleuchtung – Zusammenstellung * des Umweltbundesamtes (UBA), Deutschland


Entwürfe der EU-Kommission vom 3. Juli 2018

# Stellungnahme des Herstellerverbandes LE ** vom August 2018

– Produktgestaltung –

*Hinweis: Bitte beachten Sie, daß der angehängte Text nur in Englisch verfaßt ist.*

**EN:** Information on the coming EU Lighting Regulations – Ecodesign and Energy Labelling – Compilation * of the Federal Environment Agency (UBA), Germany

The EU Commission's drafts of 3 July 2018

# Comments by the Industry Association LE ** as of August 2018

– Product design –

---

**FR:** Informations sur les futures réglementations de l'UE concernant l'éclairage – l'écoconception et l'étiquetage énergétique – Compilation * de l'Agence Fédérale de l'Environnement (UBA), Allemagne

Les projets de la Commission Européenne du 3 juillet 2018

# Commentaires de l'association de producteurs LE ** d'août 2018

– Conception des produits –

*Indication : Veuillez noter que le présent texte n'est disponible qu'en anglais.*

---

* https://www.eup-network.de/de/eup-netzwerk-deutschland/offenes-forum-eu-regelungen-beleuchtung/dokumente/texte/

** LE = Lighting Europe; http://www.lightingeurope.org/

**Liste der von Lighting Europe (LE) im August 2018 versandten Dokumente und Kennzeichnung des vorliegenden Textes**

- Hauptanliegen (10. August 2018)
- Produktgestaltung (29. August 2018)
- Produktinformation (29. August 2018)

**EN**: List of the documents, sent out by Lighting Europe (LE) in August 2018 and identification of the text at hand

- Main concerns (10 August 2018)
- Product design (29 August 2018)
- Product information (29 August 2018)

**FR**: Liste des documents qui Lighting Europe (LE) a envoyé en août 2018 et marquage de le présent document

- Préoccupations principales (10 août 2018)
- Conception des produits (29 août 2018)
- Informations relatives au produit (29 août 2018)

---

Es folgt ein unveränderter Originaltext.

**EN**: The following is an unmodified original text.

**FR**: Ce qui suit est un texte original.

**LightingEurope – Table with comments to 3 July 2018 Commission draft text on eco-design measures for lighting (SLR)**
**Date: 29 August 2018**

| Commission proposal (3 July 2018) | LightingEurope proposal | LightingEurope comments |
|---|---|---|
| **Preamble**<br><br>THE EUROPEAN COMMISSION,<br><br>Having regard to Article 114 of the Treaty on the Functioning of the European Union,<br><br>Having regard to Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products1, and in particular Article 15(1) thereof,<br><br>After consulting the Consultation Forum referred to in Article 18 of Directive 2009/125/EC,<br><br>Whereas:<br>(1) Directive 2009/125/EC requires the Commission to set ecodesign requirements for energy-related products representing significant volumes of sales and trade, having a significant environmental impact and presenting significant potential for improvement through design in terms of their environmental impact, without entailing excessive costs. | | |
| (2) Article 16(2)(a) of Directive 2009/125/EC provides that the Commission should, where appropriate, introduce implementing measures for products which offer significant potential for reducing greenhouse gas emissions in a cost-effective way, such as the lighting products in the scope of this Regulation. These implementing measures should be introduced in accordance with the procedure referred to in Article 19(3) and the | | |

| | | |
|---|---|---|
| criteria set out in Article 15(2) of the same Directive. | | |
| (3) The Commission established ecodesign requirements for lighting products in three Commission Regulations implementing Directive 2009/125/EC: Commission Regulation (EC) No 244/2009 and its successive amendments3, Commission Regulation (EC) No 245/2009 and its successive amendments and Commission Regulation (EU) No 1194/20126 and its successive amendment. | | |
| (4) Article 7 of Commission Regulation (EC) No 244/2009, Article 8 of Commission Regulation (EC) No 245/2009 and Article 7 of Commission Regulation (EU) No 1194/2012 require the Commission to review the Regulations in light of technological progress. | | |
| (5) The Commission has reviewed Commission Regulation (EC) No 244/2009, Commission Regulation (EC) No 245/2009 and Commission Regulation (EU) No 1194/2012 and analysed the technical, environmental and economic aspects of lighting products as well as real-life user behaviour. The review was undertaken in close cooperation with stakeholders and interested parties from the Union and third countries. The results of the review were made public and presented to the Consultation Forum established by Article 18 of Directive 2009/125/EC. | | |
| (6) The review study shows the benefit of updating the requirements for lighting products. The review also shows the benefit of simplifying the requirements to be applied to lighting products, in particular by having one single regulation for this product group. | | |
| (7) The unification of the three existing regulations is in line with the Commission's | | |

| | | |
|---|---|---|
| 'Better Regulation' policy with the main aim to decrease administrative burden for manufacturers and importers, and to facilitate verification by market surveillance authorities, inter alia by better defining the scope and exemptions, reducing the number of parameters for compliance testing and decreasing the time of some test procedures. | | |
| (8) Following the review, a uniform formula is set to calculate the energy efficiency for all the lighting products that are in the scope of the three existing regulations. Light sources and their control gears as defined in Article 2 come within the subject of this Regulation resulting from the combination of the products in scope of Commission Regulation (EC) No 244/2009, Commission Regulation (EC) No 245/2009 and Commission Regulation (EU) No 1194/2012. | **Add exemption for control gear having a DMX interface.** | In (8) it is stated that the scope of this new Regulation is light sources as within the scope of Regulations 244/2009, 245/2009, and 1194/2012. However, these existing Regulations exclude applications for entertainment lighting and architecture lighting. This means that light sources and control gear for these applications were exempted. While this new draft has now exemptions for the light sources used in these applications, there are no proposals taken over from lighting industry to exempt the control gear used in these applications. This means that lamps can be replaced, but not the broken control gear. |
| (9) The annual electricity consumption of products subject to this Regulation in the Union was estimated at 336 TWh in 2015, covering 12.4 % of the overall EU28 electricity use, corresponding to 132 million tonnes of CO2 equivalent. While the projected energy consumption of lighting products in a business as usual scenario will decrease by 2030, this reduction is expected to slow down unless the existing ecodesign requirements are updated. | | |
| (10) The environmental aspects of lighting products in the scope of this Regulation that have been identified as significant for the purposes of this Regulation are energy consumption in the use phase along with mercury content and mercury emissions. | | |

| | | |
|---|---|---|
| (11) As the mercury content of light sources is restricted by Directive 2011/65/EU of the European Parliament and of the Council (RoHS)8, no specific ecodesign requirements on mercury content should be set in this Regulation. Moreover, setting additional energy efficiency requirements for light sources should lead to a decrease in the overall mercury emissions. | | |
| (12) The Commission Communications on circular economy9 and on the ecodesign working plan10 underline the importance of using the ecodesign framework to support the move towards more resource efficient and circular economy. The WEEE Directive 2012/19/EU11 refers to Directive 2009/125/EC indicating that ecodesign requirements should facilitate the re-use, dismantling and recovery of WEEE by tackling the issues upstream. The WEEE Directive already sufficiently covers end-of-life aspects of lighting products. Therefore this Regulation should not lay down further requirements contributing to recyclability. | | |
| (13) This Regulation lays down specific requirements for standby and networked standby electric power demand of lighting products. Therefore, the requirements of Commission Regulation (EC) No 1275/200812 should not apply to lighting products covered by the scope of this Regulation and for which specific requirements are set. | | |
| (14) Mandatory ecodesign requirements apply to products placed on the Union market wherever they are installed or used and should therefore not be made dependent on the application in which the product is used. | | |
| (15) The ecodesign requirements should not affect functionality from the user's | | |

| | | |
|---|---|---|
| perspective and should not negatively affect health, safety or the environment. | | |
| (16) Exemptions from the requirements set out in this Regulation should be made for light sources with special technical features for use in specific applications, including those related to health and safety, and for which higher energy efficiency alternatives are not available or not cost-effective. | | |
| (17) Measurements of the relevant product parameters should be performed through reliable, accurate and reproducible measurement methods, which take into account the recognised state-of-the-art measurement methods including, where available, harmonised standards adopted by the European standardisation organisations, as listed in Annex I to Regulation (EU) No 1025/201213. | | |
| (18) In accordance with Article 8 of Directive 2009/125/EC, this Regulation should specify the applicable conformity assessment procedures. | | |
| (19) To facilitate compliance checks, manufacturers should provide information in the technical documentation referred to in Annexes IV and V to Directive 2009/125/EC in so far as that information relates to the requirements laid down in this Regulation. The parameters of the technical documentation in accordance with this Regulation which are identical to the parameters of the product information sheet in accordance with Commission Regulation (EU) XXX with regard to energy labelling of light sources and which have been entered in the product database should no longer be included in the technical documentation of this Regulation. | | |

| | | |
|---|---|---|
| (20) Commission Regulation (EU) 2016/2282 (14) amends several ecodesign implementing measures with regard to the use of tolerances in verification procedures of the measured parameters by Member State authorities. However, it did not amend the three Regulations on lighting products, but clarified that the intended use of tolerances for lighting products would be reassessed in conjunction with their review. Hence this Regulation specifies tolerance values for lighting parameters and adopts the approach of declared values as laid down in Commission Regulation (EU) 2016/2282. | | |
| (21) To improve the effectiveness and credibility of the Regulation and to protect consumers, products that automatically alter their performance in test conditions to improve the declared parameters should be prohibited. | | |
| (22) In addition to the legally binding requirements laid down in this Regulation, indicative benchmarks for best available technologies should be identified to make information on the life-cycle environmental performance of products subject to this Regulation widely available and easily accessible, in accordance with Directive 2009/125/EC, Annex 1, part 3(2). | | |
| (23) A review of this Regulation should assess the appropriateness and effectiveness of its provisions in achieving its goals. The timing of the review should be sufficient for all provisions to be implemented and show an effect on the market. | | |
| (24) Commission Regulation (EC) No 244/2009, Commission Regulation (EC) No 245/2009 and Commission Regulation (EU) No 1194/2012 should be repealed and new | | |

| | | |
|---|---|---|
| provisions should be laid down by this Regulation to ensure that the ecodesign requirements for lighting products continue to accelerate the market transformation towards energy- efficient technologies. | | |
| (25) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 19(1) of Directive 2009/125/EC.<br><br>HAS ADOPTED THIS REGULATION: | | |
| **Article 1: Subject matter and scope**<br>1. This Regulation establishes ecodesign requirements for placing on the market of<br><br>(a) light sources;<br>(b) separate control gears.<br><br>The requirements also apply to light sources and separate control gears placed on the market in a containing product. | | |
| 2. This Regulation shall not apply to light sources and separate control gears specified in Annex III points 1 and 2. | | |
| 3. Light sources and separate control gears specified in Annex III point 3 shall comply only with the requirements of Annex II point 3.5. | 3. Light sources and separate control gears specified in Annex III point 3 shall comply only with the requirements of Annex II point 3~~.5~~**(e)**. | Editorial mistake |
| **Article 2: Definitions**<br>For the purpose of this Regulation the definitions in Article 2 of Directive 2009/125/EC shall apply. In addition, the definitions in Annex I of this Regulation and the following definitions shall apply:<br>1. 'light source' means an electrically operated product intended to emit and/or be possibly tuned to emit light with all of the following optical characteristics: | | |
| (a) chromaticity coordinates x and y in the range<br>0,270 < x < 0,530 and | | |

| | | |
|---|---|---|
| (b) a luminous flux < 500 lm per mm² of projected light-emitting surface area as defined in Annex I; | (b) a luminous flux < **264** ~~500~~ lm per mm² of projected light-emitting surface area as defined in Annex I; | The HID stage and studio lamps to be included in (a) and lowering the luminous flux < 1,000 lm per mm2 of projected light-emitting surface area in Article 2: Definitions (1)(b) to luminous flux < 264, the HID stage and studio lamps would be exempted by this parameter and would not need any other technical parameter that makes them special purpose. In the note is mentioned that the value of 1,000 is well above what LEDs can do (264 lm/mm2). |
| (c) a luminous flux between 60 and 82 000 lumen; | | |
| (d) a colour rendering index (CRI) Ra > 0; | | |
| using incandescence, fluorescence, high-intensity discharge, inorganic light emitting diodes (LED) or organic light emitting diodes (OLED), or their combinations as lighting technology, and that can be verified as a light source according to the procedure of Annex V.<br><br>High-pressure sodium light sources that do not fulfil condition (a) are anyway considered light sources in the sense of this Regulation. | using incandescence, fluorescence, high-intensity discharge, inorganic light emitting diodes (LED) or organic light emitting diodes (OLED), or their combinations as lighting technology, ~~and that can be verified as a light source according to the procedure of Annex V~~.<br><br>High-pressure sodium light sources that do not fulfil condition (a) are anyway considered light sources in the sense of this Regulation. | Annex V is only intended for LED and OLED sources. Article 2 in contrast requires that a light source must be verifiable according to Annex V. This is not possible, e.g. for incandescent sources, as their lifetime is < 3600 h (test time of Annex V). |
| For the purpose of this Regulation, the following products are not considered to be light sources:<br><br>(a) LED dies or LED chips;<br>(b) LED packages;<br>(c) products containing light source(s) from which these light source(s) can be removed for verification;<br>(d) light-emitting parts contained in a light source from which these parts cannot be removed for verification as a light source. | | |
| 2. ‘control gear’ means one or more devices, possibly integrated in a light source, intended to prepare the mains electricity supply for the electric format required by one or more specific light sources within boundary conditions set by electric safety and electromagnetic compatibility. It may | | |

| | | |
|---|---|---|
| include transforming the supply and starting voltage, limiting operational and preheating current, preventing cold starting, correcting the power factor and/or reducing radio interference. 'Mains' or 'mains voltage' or 'mains electricity supply' (MV) means the electricity supply of 230 (±10 %) Volt of alternating current at 50 Hz.<br><br>The term 'control gear' does not include power supplies within the scope of Commission Regulation (EC) No 278/200915. The term does also not include lighting control parts and non-lighting parts (as defined in Annex I), although such parts may be physically integrated with a control gear or marketed together as a single product.<br><br>A Power over Ethernet (PoE) switch is not a control gear in the sense of this Regulation. 'Power-over-Ethernet switch' or 'PoE switch' means equipment for power-supply and data-handling that is installed between the mains and office equipment and/or light sources for the purpose of data transfer and power supply; | | |
| 3. 'separate control gear', means a control gear that is not physically integrated with a light source and is placed on the market as a separate product or as a part of a containing product; | | |
| 4. 'containing product' means a product containing one or more light sources and/or separate control gears. Examples of containing products are luminaires that can be taken apart to allow separate verification of the contained light source(s), household appliances containing light source(s), furniture (shelves, mirrors, display cabinets) containing light source(s), and other | 4. 'containing product' means a product containing one or more light sources and/or separate control gears **that can be removed for verification**. Examples of containing products are luminaires that can be taken apart to allow separate verification of the contained light source(s), household appliances containing light source(s), furniture (shelves, mirrors, display cabinets) | The definition of containing product is not clear for sealed-for-life products. If a containing product is sealed-for-life and has to be considered as a light source and has to be measured as such, this should be clearly stated: one should not have to read between the lines to understand the meaning of legislation. |

| | | |
|---|---|---|
| products that cannot be practically verified as light source themselves, so that the contained light source(s) have to be considered; | containing light source(s), and other products that cannot be practically verified as light source themselves, so that the contained light source(s) have to be considered.~~;~~ **If a containing product cannot be taken apart for verification of the light source and separate control gear, then the entire product is to be considered a light source;** | NOTE: by definition, an empty luminaire without light source and/or control gear is neither containing product nor light source. |
| 5. 'light' means electromagnetic radiation with a wavelength between 380 nm and 780 nm; | | |
| 6. 'LED die or LED chip' means a small block of light-emitting semiconducting material on which a functional light emitting diode (LED) circuit is fabricated; | | |
| 7. 'LED package' means a single electric part comprising principally at least one LED die. It does not include (parts of) a control gear, does not include a cap, is not connected directly to the supply voltage, and does not include active electronic components. It is used as a part of an LED module or of an LED lamp. It can include one or more of the following: optical elements, light converters (phosphors), thermal, mechanical and electric interfaces, parts to address electrostatic discharge concerns. So called Chip-on-Board (CoB) packages, and similar light-emitting devices that are intended to be used directly in an LED luminaire, are not considered to be LED packages, but LED modules; | 7. 'LED package' means a single electric part comprising principally at least one LED die. It does not include (parts of) a control gear, does not include a cap, is not connected directly to the ~~supply~~ **mains** voltage, and does not include active electronic components. It is used as a part of an LED module or of an LED lamp. It can include one or more of the following: optical elements, light converters (phosphors), thermal, mechanical and electric interfaces, parts to address electrostatic discharge concerns. So called Chip-on-Board (CoB) packages, and similar light-emitting devices that are intended to be used directly in an LED luminaire, are not considered to be LED packages, but LED modules; | Use of "supply" and "mains" ambiguous. Recommendation to clarify by using "mains." |
| 8. 'chromaticity' means the property of a colour stimulus defined by its chromaticity coordinates (x and y). | | |
| 9. 'luminous flux' or 'flux' (Φ), expressed in lumen (lm), means the quantity derived from radiant flux (radiant power) by evaluating the electromagnetic radiation in accordance with the spectral sensitivity of the human eye. It | 9. 'luminous flux' or 'flux' (Φ), expressed in lumen (lm), means the quantity derived from radiant flux (radiant power) by evaluating the electromagnetic radiation in accordance with the spectral sensitivity of the human eye. It | Wrong reference. Replace with reference to Annex I. |

| | | |
|---|---|---|
| refers to the total flux emitted by a light source in a solid angle of 4π steradians under conditions (e.g. current, voltage, temperature) specified in applicable standards. It refers to the initial flux for the undimmed light source after a short operating period, unless it is clearly specified that the flux in a dimmed condition or the flux after a given period of operation is intended. For light sources that can be tuned to emit different light spectra and/or different maximum light intensities, it refers to the flux in the 'reference control settings' as defined in Annex II; | refers to the total flux emitted by a light source in a solid angle of 4π steradians under conditions (e.g. current, voltage, temperature) specified in applicable standards. It refers to the initial flux for the undimmed light source after a short operating period, unless it is clearly specified that the flux in a dimmed condition or the flux after a given period of operation is intended. For light sources that can be tuned to emit different light spectra and/or different maximum light intensities, it refers to the flux in the 'reference control settings' as defined in Annex **I** ~~II~~; | |
| 10. 'colour rendering index' (CRI) is the average Ra of the colour rendering for the first 8 test colours (R1-R8) defined in standards, and means the effect of an illuminant on the colour appearance of objects by conscious or subconscious comparison with their colour appearance under the reference illuminant; | | |
| 11. 'incandescence' means a phenomenon where light is produced from heat, in light sources typically produced through a threadlike conductor ('filament') which is heated by the passage of an electric current. Incandescent light sources are either GLS - General Lamp Shape light sources or halogen light sources. Halogen light source means an incandescent light source with a threadlike conductor made from tungsten surrounded by gas containing halogens or halogen compounds; | 11. 'incandescence' means a phenomenon where light is produced from heat, in light sources typically produced through a threadlike conductor ('filament') which is heated by the passage of an electric current. ~~Incandescent light sources are either GLS - General Lamp Shape light sources or halogen light sources.~~ Halogen light source ~~means an~~ **are also** incandescent light source**s** with a threadlike conductor made from tungsten surrounded by gas containing halogens or halogen compounds; | "'Incandescent light sources are either GLS General Lamp Shape" - this is not true, other technologies can also have General Lamp Shape. GLS can also mean General Lighting Service and usually refers to a particular bulb shape. |
| 12. 'fluorescence' or 'fluorescent light source' (FL) means the phenomenon or a light source using an electric gas discharge of the low-pressure mercury type in which most of the light is emitted by one or more layers of phosphors excited by the ultraviolet radiation | | |

| | | |
|---|---|---|
| from the discharge. Fluorescent light sources may have one ('single-capped') or two ('double-capped') connections (‘caps’) to their electricity supply. For the purposes of this Regulation, magnetic induction light sources are also considered as fluorescent light sources; | | |
| 13. ‘high intensity discharge’ (HID) means an electric gas discharge in which the light-producing arc is stabilised by wall temperature and the arc chamber has a bulb wall loading in excess of 3 Watts per square centimetre. ‘Gas discharge’ means a phenomenon where light is produced, directly or indirectly, by an electric discharge through a gas, plasma, metal vapour or mixture of gases and vapours. For the purpose of this Regulation, HID light sources are limited to metal halide, high-pressure sodium and mercury vapour types as defined in Annex I; | | |
| 14. ‘inorganic light emitting diode’ (LED) means a technology in which light is produced from a solid state device embodying a p-n junction of inorganic material. The junction emits optical radiation when excited by an electric current; | | |
| 15. ‘organic light emitting diode’ (OLED) means a technology in which light is produced from a solid state device embodying a p-n junction of organic material. The junction emits optical radiation when excited by an electric current; | | |
| 16. ‘high-pressure sodium light source’ (HPS) means a high intensity discharge light source in which the light is produced mainly by radiation from sodium vapour operating at a partial pressure of the order of 10 kilopascals. HPS light sources may have | | |

| | | |
|---|---|---|
| one ('single-ended') or two ('double-ended') connectors to their electricity supply. | | |
| **Article 3: Ecodesign requirements**<br><br>Products in scope of this Regulation shall comply with the ecodesign requirements set out in Annex II from the dates indicated therein. | | |
| **Article 4: Removal of light sources and separate control gears** | | |
| 1. Manufacturers and importers of containing products shall ensure that light sources and separate control gears can be removed without being permanently damaged for verification purposes by market surveillance authorities and without permanent damage to the containing product. For containing products, instructions should be available on request on how light sources and separate control gears can be removed for verification without these being permanently damaged and without permanent damage to the containing product. | 1. Manufacturers and importers of containing products shall ensure that light sources and separate control gears can be removed without being permanently damaged for verification purposes by market surveillance authorities ~~and without permanent damage to the containing product~~. For containing products, instructions should be available on request on how light sources and separate control gears can be removed for verification without these being permanently damaged ~~and without permanent damage to the containing product~~. | **Summary**<br>The Commission's proposal for Art. 4(1) requires that containing products should allow removability of both the light source and the control gear with "no damage" to containing products when verifying the light source. Due to other provisions in the text (in Art. 2), a number of integrated luminaires will be considered as a light source and will be therefore phased-out as they will not be able to comply with efficacy requirements of a light source. Integrated luminaires are needed in a number of special applications or for safety reasons. LightingEurope proposes to allow them on the market enabling verification, removability at the end of life and information requirements on replaceability or non-replaceability for the end users.<br><br>**Motivation**<br>- A lot of luminaires applications (high IP protection, recessed decorative, special shapes that requires gluing of LED modules on heatsinks, etc.), where light sources (the LED module) cannot removed without permanent damage to the containing product, will fall under the definition of a light source and therefore will not meet the efficacy requirement as a whole light source and will be therefore banned by the Regulation.<br>- In a previous draft of the Regulation (November 2017), in the original para. 23 of the Preamble, there was a reference to the aim to "provide |

| | | |
|---|---|---|
| | | sufficient time to manufacturers to re-design products subject to this Regulation. The timing should be such that any negative impact on functionalities of products on the market is avoided and that the cost impact for end-users and manufacturers, in particular small and medium-sized enterprises, is taken into account, while ensuring timely achievement of the objectives of this Regulation." This aspect has now disappeared, but this Art. 4(1) causes exactly what this original statement said that should be avoided, i.e. a phase-out of several professional products within a short timeframe, in September 2021.<br>- We do agree with the European Commission that verification for market surveillance authorities (MSAs) needs to be facilitated: in principle, the light source and the control gear should not be damaged when removing them from the containing product, even if this mean destroying the containing product. We also believe that there is no need to restore full functionality of the containing products after the verification tests carried out by MSAs. A verified sample cannot be brought back to the market for sale. |
| 2. Manufacturers and importers of containing products shall ensure that light sources and separate control gears can be dismantled from containing products at end of life. Instructions shall be available on request. | | |
| 3. Manufacturers and importers of containing products shall provide information about the replaceability or non-replaceability of light sources and control gears by end-users or qualified persons without permanent damage to the containing product. Such information shall be available on free-access websites. For products sold directly to end-users, this information shall be on the | 3. Manufacturers and importers of containing products shall provide information about the replaceability **without permanent damage to the containing product** or non-replaceability of light sources and control gears by end-users or qualified persons ~~without permanent damage to the containing product~~. Such information shall be available on free-access websites. For products sold directly to end-users, this information shall | This requirement is indeed only relevant to replaceability. We propose to better clarify the text in order to avoid confusion.<br><br>Safety standards require that this information is included in the user instructions; LightingEurope recommends to align with standards. |

| | | |
|---|---|---|
| packaging, at least in the form of a pictogram. | be on the packaging **or in the user instructions**, at least in the form of a pictogram. | |
| **Article 5: Conformity assessment** | | |
| 1. The conformity assessment procedure referred to in Article 8 of Directive 2009/125/EC shall be the internal design control system set out in Annex IV to that Directive or the management system set out in Annex V to that Directive. | 1. The conformity assessment procedure referred to in Article 8 of Directive 2009/125/EC shall be the internal design control system set out in Annex IV to that Directive or the management system set out in Annex V to that Directive. **For the purposes of conformity assessment pursuant to Article 8 of Directive 2009/125/EC, the technical documentation file shall: (a) contain a copy of the product information provided in accordance with part 3 of Annex III to this Regulation; (b) provide any other information required by Annexes I, III and IV to be present in the technical documentation file; (c) specify at least one realistic combination of product settings and conditions in which the product complies with this Regulation.** | According to Art. 8 of Directive 2009/125/EC, a study on the environmental impact is a required element. It is proposed to reintroduce, directly in Art. 5, a sentence as in any existing Regulation that replaces the environmental study by a collection of all product information required by the Regulation itself. This is to avoid an additional burden and to reduce disputes in case of market surveillance because there is no reference for content details. |
| 2. Where the information included in the technical documentation for a particular model has been obtained by calculation on the basis of design, or extrapolation from another model, or both, the documentation shall include details of such calculations or extrapolations, or both, and of tests undertaken by manufacturers to verify the accuracy of the calculations undertaken. | | |
| **Article 6: Verification procedure for market surveillance purposes**<br><br>Member States shall apply the verification procedure described in Annex IV to this Regulation when performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC. | | |

| | | |
|---|---|---|
| **Article 7: Circumvention**<br><br>The manufacturer or importer shall not place on the market products that have been designed so that a model's performance is automatically altered in test conditions with the objective of reaching a more favourable level for any of the parameters declared by the manufacturer in the technical documentation or included in any of the documentation provided with the product.<br><br>Where applicable, the power consumption of the product shall not increase after a software or firmware update when measured with the same test standard originally used for the declaration of conformity, except with explicit consent of the end-user. | | |
| **Article 8: Indicative benchmarks**<br><br>The indicative benchmarks for the best-performing products and technologies available on the market at the time of adopting this Regulation are set out in Annex VI. | | |
| **Article 9: Evaluation**<br><br>The Commission shall assess this Regulation and shall present the results of this assessment, including, if appropriate, a draft revision proposal, to the Consultation Forum no later than five years after its entry into force. | | |
| This assessment shall review the requirements in the light of the technological progress and shall address in particular:<br>– setting more stringent energy efficiency requirements for all light source types, in particular for non-LED light source types, and for separate control gears;<br>– setting requirements on lighting control parts;<br>– setting more stringent requirements on flicker and stroboscopic effects;<br>– setting requirements on dimming, including the interaction with flicker; | This assessment shall review the requirements in the light of the technological progress **both in terms of energy efficiency and the needs of quality of light** ~~and shall address in particular~~<br>~~– setting more stringent energy efficiency requirements for all light source types, in particular for non-LED light source types, and for separate control gears;~~<br>~~– setting requirements on lighting control parts;~~<br>~~– setting more stringent requirements on flicker and stroboscopic effects;~~ | This assessment is foreseen for 2024, so in 6 years from now. It is against any logic or proper governance to "pre- regulate" items so long in advance. Thereby limiting any future consumer choice, freedom of enterprise, blocking future innovation etc. This is not to the benefit of the EU nor to its citizens. It conflicts with the general rule of less regulations better enforced.<br><br>Next to energy efficiency, the quality of light should be taken into account during the next review of the ecodesign legislation for lighting. |

| | | |
|---|---|---|
| – setting more stringent requirements on (networked) standby power;<br>– lowering or abolishing the power bonus for colour-tuneable light sources and removing the exemption for high colour purity;<br>– substituting the CRI colour rendering metric by a more adequate metric;<br>– verifying the adequacy of lumen as a stand-alone metric for the quantity of visible light;<br>– setting additional resource efficiency requirements for products in accordance with the principles of the circular economy. | ~~– setting requirements on dimming, including the interaction with flicker;~~<br>~~– setting more stringent requirements on (networked) standby power;~~<br>~~– lowering or abolishing the power bonus for colour-tuneable light sources and removing the exemption for high colour purity;~~<br>~~– substituting the CRI colour rendering metric by a more adequate metric;~~<br>~~– verifying the adequacy of lumen as a stand-alone metric for the quantity of visible light;~~<br>~~– setting additional resource efficiency requirements for products in accordance with the principles of the circular economy.~~ | However, specifying specific lighting aspects is too early in light of the technological progress and ongoing discussions on quality of light in standardisation bodies (e.g. CIE, IEC, ISO). |
| **Article 10: Repeal**<br><br>Commission Regulation (EC) No 244/2009, Commission Regulation (EC) No 245/2009 and Commission Regulation (EU) No1194/2012 shall be repealed as from 31 August 2021. | | |
| **Article 11: Entry into force and application**<br><br>1. This Regulation shall enter into force on the twentieth day following that of its publication in the Official Journal of the European Union. | | |
| 2. This Regulation shall apply from 1 September2021. | | |
| This Regulation shall be binding in its entirety and directly applicable in all Member States.<br><br>*Done at Brussels,*<br><br>For the Commission<br><br>*Jean-Claude JUNCKER* | | |

**ANNEXES**

| | | |
|---|---|---|
| **ANNEX I – Definitions applicable for the Annexes**<br><br>In addition to the definitions set out in Directive 2009/125/EC and the definitions set out in Article 2 of this Regulation, the following definitions shall apply:<br>(1) 'mains light source (MLS)' means a light source that can be operated directly on the mains electricity supply. Light sources that operate directly on the mains, and can also operate indirectly on the mains using a separate control gear, shall be considered to be mains light sources; | | |
| (2) 'non-mains light source (NMLS)', means a light source that is not a mains light source. These light sources require a separate control gear to operate on the mains; | | |
| (3) 'directional light source' (DLS) means a light source having at least 80 % of total luminous flux within a solid angle of π sr (corresponding to a cone with angle of 120°); | | |
| (4) 'non-directional light source' (NDLS) means a light source that is not a directional light source; | | |
| (5) 'connected light source' (CLS) means a light source including data-connection parts that are physically or functionally inseparable from the light emitting parts to maintain the 'reference control settings';<br><br>The light source can have physically integrated data-connection parts in a single inseparable housing, or the light source can be combined with physically separate data-connection parts placed on the market together with the light source as a single product. | | |
| (6) 'connected separate control gear' (CSCG) means a separate control gear including | | |

| | | |
|---|---|---|
| data-connection parts that are physically or functionally inseparable from the actual control gear parts to maintain the 'reference control settings';<br><br>The separate control gear can have physically integrated data-connection parts in a single inseparable housing, or the separate control gear can be combined with physically separate data-connection parts placed on the market together with the control gear as a single product; | | |
| (7) 'data-connection parts' means parts that perform any one of the following functions:<br>(a) reception or transmission of wired or wireless data signals and the processing thereof (either used to control the light emission function or otherwise), | (7) 'data-connection parts' means parts that perform any one of the following functions:<br>a) reception or transmission of wired or wireless data signals and the processing thereof (~~either~~ used to control the light emission ~~function or~~ **and possibly** otherwise), | Data-connection parts definition is used in CLS and CSCG intended to maintain the 'reference control settings.' The 'reference control settings' refer to light settings. This means that data connection parts shall at least have a functionality to control the light. This means that the statement 'either used to control the light emission or otherwise' need to be changed to reflect this. |
| (b) sensing and processing of the sensed signals (either used to control the light emission function or otherwise), | (b) sensing and processing of the sensed signals (~~either~~ used to control the light emission ~~function or~~ **and possibly** otherwise), | Idem. |
| (c) actuation by audio control (including voice control), | | |
| (d) a combination of these; | | |
| (8) 'colour-tuneable light source' (CTLS) means a light source that can be set to emit light with a large variation of colours outside the range defined in article 2(1) but can also be set to emit white light inside the range defined in article 2(1) for which the light source is in scope of this Regulation;<br><br>The term does not include tuneable-white light sources that can only be set to emit light, with different correlated colour temperatures, within the range defined in Article 2(1). | (8) 'colour-tuneable light source' (CTLS) means a light source that can be set to emit light with a large variation of colours outside the range defined in article 2(1) but can also be set to emit white light inside the range defined in article 2(1) for which the light source is in scope of this Regulation;<br><br>The term does ~~not~~ include tuneable-white light sources that **allow a continuous tuneable white with more than 2000 K variation in CCT** ~~can only be set to emit light, with different correlated colour~~ | Include tuneable-white light sources that allow a continuous tuneable white with more than 2,000 K variation in CCT in the definition of CTLS. Other tuneable white and dim-to-warm light sources are not included. CTLS are less efficient due to technology limitations. |

| | | |
|---|---|---|
| The term also does not include dim-to-warm light sources, that shift their white light output to lower correlated colour temperature when dimmed, simulating the behaviour of incandescent light sources; | ~~temperatures, within the range defined in Article 2(1)~~.<br><br>The term also does not include dim-to-warm light sources, that shift their white light output to lower correlated colour temperature when dimmed, simulating the behaviour of incandescent light sources; | |
| (9) 'colour purity index': a percentage computed for a CTLS set to emit light of a certain colour, using a procedure further defined in standards, by drawing a straight line on an (x,y) colour space graph from a point with colour coordinates x=0.313 and y=0.330 (D65 reference point, point 1), going through the point representing the (x,y) colour coordinates of the light source (point 2), and ending on the outer border of the colour space (locus; point 3). The colour purity index is computed as the distance between points 1 and 2 divided by the distance between points 1 and 3. The full length of the line represents 100% colour purity (point on the locus). The D65 reference point represents 0% colour purity (white light); | | |
| (10) 'lighting control parts' means parts that are integrated in a light source or in a separate control gear, or physically separated but marketed together with a light source or separate control gear as a single product, that are not strictly necessary for the light source to emit light at full-load, or for the separate control gear to supply the electric power that enables light source(s) to emit light at full-load, but that enable manual- or automatic-, direct- or remote-, control of luminous intensity, chromaticity, correlated colour temperature, light spectrum and/or beam angle. Dimmers shall also be considered as lighting control parts; | | |

| | | |
|---|---|---|
| The term also includes data-connection parts, but the term does not include products within the scope of Commission Regulation (EC) No 1275/20081; | | |
| (11) 'non-lighting parts' means parts that are integrated in a light source or in a separate control gear, or physically separate but marketed together with a light source or separate control gear as a single product, that are not necessary for the light source to emit light at full-load, or for the separate control gear to supply the electric power that enables light source(s) to emit light at full-load, and that are not 'lighting control parts'. Examples include, but are not limited to: speakers (audio), cameras, repeaters for communication signals to extend the range (e.g. WiFi), parts supporting grid balance (switching to own internal batteries when necessary), battery charging, visual notification of events (mail arriving, door bell ringing, alert), use of Light Fidelity (Li-Fi, a bidirectional, high-speed and fully networked wireless communication technology); | | |
| (12) 'useful luminous flux' (Φuse), means the part of the luminous flux of a light source that is considered when determining its energy efficiency:<br>– for non-directional light sources it is the total flux emitted in a solid angle of 4π sr (corresponding to a 360˚ sphere). | | |
| – for directional light sources with beam angle ≥ 90° it is the flux emitted in a solid angle of π sr (corresponding to a cone with angle of 120°). | | |
| – for directional light sources with beam angle < 90° it is the flux emitted in a solid angle of 0.586π sr (corresponding to a cone with angle of 90°). | | |

| | | |
|---|---|---|
| (13) ‘beam angle’ of a directional light source means the angle between two imaginary lines in a plane through the optical beam axis, such that these lines pass through the centre of the front face of the light source and through points at which the luminous intensity is 50 % of the centre beam intensity, where the centre beam intensity is the value of luminous intensity measured on the optical beam axis;<br><br>For light sources that have different beam angles in different planes, the largest beam angle shall be the one taken into account;<br><br>For light sources with user-controllable beam angle, the beam angle corresponding to the ‘reference control setting’ shall be the one taken into account; | | |
| (14) ‘full-load’ means:<br>– the condition of a light source, within the declared operating conditions, in which it emits the maximum (undimmed) initial luminous flux, or<br>– the operating conditions and loads of the control gear under efficiency measurement as specified in the relevant standards; | | |
| (15) ‘no-load mode' means the condition of a separate control gear in which its input is connected to the mains power source and its output is intentionally disconnected from light sources, and, if applicable, from data-connection parts, lighting control parts and non-lighting parts. If these parts cannot be disconnected, they shall be switched off and their power consumption shall be minimized following the manufacturer’s instructions;<br><br>No-load mode only applies to separate control gear for which the manufacturer or importer has declared in the technical | (15) ‘no-load mode' means the condition of a separate control gear in which its input is connected to the mains power source and its output is intentionally disconnected from light sources, and, if applicable, ~~from data-connection parts,~~ lighting control parts and non-lighting parts. If these parts cannot be disconnected, they shall be switched off and their power consumption shall be minimized following the manufacturer’s instructions;<br><br>No-load mode only applies to separate control gear for which the manufacturer or importer has declared in the technical | Since the term 'lighting control parts' includes 'data connection parts', see (10), there is no need to mention data-connection parts in this definition. |

| | | |
|---|---|---|
| documentation that it has been designed for this mode; | documentation that it has been designed for this mode; | |
| (16) 'standby mode' means the condition of a light source or of a separate control gear, where it is connected to the power supply but the light sources are intentionally not emitting light, and the light source or control gear is awaiting a control signal (from a source different from a network) to return to a state with light emission. Lighting control parts enabling the standby function shall be in their control mode. Non-lighting parts shall be disconnected or switched off or their power consumption shall be minimized following manufacturer's instructions; | (16) 'standby mode' means the condition of a light source or of a separate control gear, where it is connected to the power supply but the light sources are intentionally not emitting light, and the light source or control gear is awaiting a control signal (from a source different from a network) to return to a state with light emission. Lighting control parts enabling the standby function shall be in their control mode. Non-lighting parts shall be disconnected or switched off or their power consumption shall be minimized following manufacturer's instructions**. Measurements shall be performed according to state-of-the-art measurement**; | From the wording of this Regulation it is not clear how the measurements shall be performed; clarification is needed. How do we interpret drivers where lighting control (presence detection) is connected?<br><br>See also: harmonised standards (e.g. EN 62442-X) |
| (17) 'networked standby mode' means the condition of a connected light source (CLS) or a connected separate control gear (CSCG) where it is connected to the power supply but the light source is intentionally not emitting light or the control gear does not supply the electric power that enables light source(s) to emit light, and is awaiting a remotely initiated trigger (from a network) to return to a state with light emission. Lighting control parts shall be in their control mode and data-connection parts shall be in a state enabling the networked standby function. Non-lighting parts shall be disconnected or switched off or their power consumption shall be minimized following manufacturer's instructions; | (17) 'networked standby mode' means the condition of a connected light source (CLS) or a connected separate control gear (CSCG) where it is connected to the power supply but the light source is intentionally not emitting light or the control gear does not supply the electric power that enables light source(s) to emit light, and is awaiting a remotely initiated trigger (from a network) to return to a state with light emission. Lighting control parts shall be in their control mode ~~and data-connection parts shall be in a state enabling the networked standby function~~. Non-lighting parts shall be disconnected or switched off or their power consumption shall be minimized following manufacturer's instructions**. Measurements shall be performed according to state-of-the-art measurement**; | Since the term 'lighting control parts' includes 'data connection parts', see (10), we do not see need for the phrase "and data-connections parts shall be in a state enabling the networked standby functions."<br><br>From the wording of this Regulation it is not clear how the measurements shall be performed; clarification is needed.<br><br>Also see: harmonised standards (e.g. EN 62442-X) |
| (18) 'control mode' means the condition of lighting control parts where they are connected to the light source and/or to the | | |

| | | |
|---|---|---|
| separate control gear and performing their functions in such a way that a control signal can be internally generated or a remotely initiated trigger can be received, by wire or wireless, and processed to lead to a change in the light emission of the light source or to a corresponding desired change in the power supply by the separate control gear; | | |
| (19) 'remotely initiated trigger' means a signal that comes from outside the light source via a network; | (19) 'remotely initiated trigger' means a signal that comes from outside the light source **or external control gear** via a network; | Since networked standby is now extended to control gear, other related definitions need to include control gear as well. |
| (20) 'control signal' means an analogue or digital signal transmitted to light source or separate control gear wirelessly or wired either via voltage modulation in separate control cables or via a modulated signal in the supply voltage. The signal transmission is not through a network but e.g. from an internal source or from a remote control delivered with the product; | | |
| (21) 'network' means a communication infrastructure with a topology of links, an architecture, including the physical components, organisational principles, communication procedures and formats (protocols); | | |
| (22) 'on-mode power' (Pon), expressed in Watt, is the electric power consumption of a light source in full-load with all lighting control parts and non-lighting parts disconnected. If these parts cannot be disconnected they shall be switched off or their power consumption shall be minimised following the manufacturer's instructions;<br><br>In case of a non-mains light source (NMLS) that requires a separate control gear to operate, Pon can be measured directly on the input to the light source, or Pon is determined using a control gear with known | | |

| | | |
|---|---|---|
| efficiency, whose electric power consumption is subsequently subtracted from the measured mains power input value; | | |
| (23) 'no-load power' (Pno), expressed in Watts, is the electric power consumption of a separate control gear in no-load mode; | | |
| (24) 'standby power' (Psb), expressed in Watts, is the electric power consumption of a light source or of a separate control gear in standby mode; | (24) 'standby power' (Psb), expressed in Watts, is the electric power consumption of a light source or of a separate control gear in standby mode**. Measurements shall be performed according to state-of-the-art measurement**; | From the wording of this Regulation it is not clear how the measurements shall be performed; clarification is needed.<br><br>See also: harmonised standards (e.g. EN 62442-X) |
| (25) 'networked standby power' (Pnet), expressed in Watts, is the electric power consumption of a connected light source (CLS) or of a connected separate control gear CSCG) in networked standby mode; | (25) 'networked standby power' (Pnet), expressed in Watts, is the electric power consumption of a connected light source (CLS) or of a connected separate control gear CSCG) in networked standby mode**. Measurements shall be performed according to state-of-the-art measurement**; | From the wording of this Regulation it is not clear how the measurements shall be performed; clarification is needed.<br><br>See also: harmonised standards (e.g. EN 62442-X) |
| (26) 'reference control settings' (RCS) means a control setting or a combination of control settings that is used to verify compliance of a light source with this Regulation. These settings are relevant for light sources that allow the end-user to control, manually or automatically, directly or remotely, the luminous intensity, colour, correlated colour temperature, spectrum, and/or beam angle of the emitted light. | | |
| In principle, the reference control settings shall be those predefined by the manufacturer as factory default values, and encountered by the user at first installation (out-of-the-box values). If the installation procedure foresees an automatic software update during first installation, or if the user has the option to perform such an update, the resulting change in settings (if any) shall be taken into account. | | |

| | | |
|---|---|---|
| If the out-of-the-box value is deliberately set differently from the reference control setting (e.g. at low power for safety purposes), the manufacturer shall indicate in the technical documentation how to recall the reference control settings for compliance verification. | | |
| The light source manufacturer shall define the reference control settings such that:<br>– the light source is in scope of this Regulation according to Art.1 and none of the conditions for exemption of Annex I applies (if this is not possible, the light source is out-of-scope or exempted); | | |
| – the power consumption of lighting control parts and non-lighting parts is minimal (if these parts cannot be disconnected or switched-off); | | |
| – the full-load condition is obtained (maximum initial luminous flux given the other chosen settings); | – the full-load condition is obtained **at settings within scope, preferably at highest obtainable luminous flux within scope** ~~(maximum initial luminous flux given the other chosen settings)~~; | Full load condition might not be achieved at maximum initial luminous flux, especially for tuneable sources and horticultural sources. One of the requirements must be prioritised. |
| – when the end-user opts to reset factory defaults, the reference control settings are obtained. | | |
| For light sources that allow the manufacturer of a containing product to make implementation choices that influence light source characteristics (e.g. definition of the operating current(s); thermal design), and that cannot be controlled by the end-user, the reference control settings need not be defined. In that case the test conditions defined in applicable standards apply; | For light sources that allow the manufacturer of a containing product to make implementation choices that influence light source characteristics (e.g. definition of the operating current(s); thermal design), and that cannot be controlled by the end-user, the reference control settings need not be defined. In that case the **nominal** test conditions ~~defined in applicable standards apply~~ **apply as defined by the light source manufacturer**; | The reference to “test conditions defined in applicable standards” is unclear (we are not aware to which standards this refers, or those standards are not ready yet) – and should be replaced by something which is recognised in the lighting industry. Another problem is that, whatever test condition is chosen, it is not generally representative of how it is used in the containing product. |
| (27) ‘high-pressure mercury light source’ means a high intensity discharge light source in which the major portion of light is produced, directly or indirectly, by radiation from | | |

| | | |
|---|---|---|
| predominantly vaporized mercury operating at a partial pressure in excess of 100 kilopascals; | | |
| (28) ‘metal halide light source’ (MH) means a high intensity discharge light source in which the light is produced by radiation from a mixture of metallic vapour, metal halides and the products of the dissociation of metal halides. MH light sources may have one ('single-ended') or two ('double-ended') connectors to their electricity supply. The material for the arc tube of MH light sources can be quartz (QMH) or ceramic (CMH); | | |
| (29) ‘compact fluorescent light source’ (CFL) means a single-capped fluorescent light source with a bent-tube construction designed to fit in small spaces. CFLs may be primarily spiral-shaped (i.e. curly forms) or primarily shaped as connected multiple parallel tubes, with or without a second bulb-like envelope. CFLs are available with (CFLi) or without (CFLni) physically integrated control gear; | | |
| (30) ‘T2’, ‘T5’, ‘T8’, ‘T9’ and ‘T12’ means a tubular light source with diameter of approximately 7, 16, 26, 29 and 38 mm respectively, as defined in harmonised standards. The tube can be straight (linear) or bent (e.g. U-shaped, circular); | | |
| (31) ‘LFL T5-HE’ means a high-efficiency linear fluorescent T5 light source with driving current lower than 0.2 A; | | |
| (32) ‘LFL T5-HO’ means a high-output linear fluorescent T5 light source with driving current higher than or equal to 0.2 A; | | |
| (33) ‘LFL T8 2-foot’, ‘LFL T8 4-foot’ or ‘LFL T8 5-foot’ means a linear T8 fluorescent light source with a length of approximately 600 mm (2 feet), 1200 mm (4 feet) or 1500 mm | | |

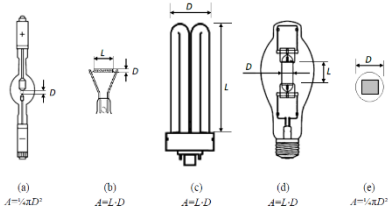
| | | |
|---|---|---|
| (5 feet) respectively, as defined in standards; | | |
| (34) 'magnetic induction light source' means a light source using fluorescent technology, where energy is transferred to the gas discharge by means of an induced high-frequency magnetic field, instead of using electrodes placed inside the gas discharge. The magnetic inductor can be external or internal to the shape of the discharge tube; | | |
| (35) 'G4', 'GY6.35' and 'G9' means an electrical interface for a light source consisting of two small pins at distances of 4, 6.35 and 9 mm respectively, as defined in standards; | | |
| (36) 'HL R7s' is a mains-voltage, double capped, linear halogen light source with a cap-diameter of 7 mm; | | |
| (37) 'G9.5', 'GX9.5', 'GY9.5', 'G9.5HPL', 'G16d', 'GX16d', 'GY16', 'G22' and 'G38' means an electrical interface for a light source consisting of two pins at distances of 9.5, 16, 22 and 38 mm respectively, as defined in standards. 'G9.5HPL' includes a heatsink of specific dimensions as used on High-Performance halogen lamps, and may include additional pins for grounding purposes; | | |
| (38) 'P28s', 'P40s' and 'PGJX50' means an electrical interface for a light source that uses a flange contact to correctly position (pre-focus) the light source in a reflector, as defined in standards; | | |
| (39) 'QXL (Quick eXchange Lamp)' means an electrical interface for a light source consisting, on the light source side, of two lateral tabs including the electrical contact surfaces and, on the opposite (rear) side, of a central protrusion allowing to grab the light source with two fingers. It has been specifically designed for use in a class of | | |

| | | |
|---|---|---|
| stage lighting luminaires, in which the light source is inserted from the rear of the luminaire using a ¼ turn rotation to fix or unfix it; | | |
| (40) 'battery-operated' means a product that operates only on direct current (DC) supplied from a source contained in the same product, without being connected directly or indirectly to the mains electricity supply; | | |
| (41) 'second envelope' means a second outer envelope on a HID light source that is not required for the production of light, such as an external sleeve for preventing mercury and glass release into the environment in case of lamp breakage. In determining the presence of a second envelope, the HID arc tubes shall not count as an envelope; | | |
| (42) 'non-clear envelope' for a HID light source means a non-transparent outer envelope or outer tube in which the light producing arc tube is not visible; | | |
| (43) 'anti-glare shield' means a mechanical or optical reflective or non-reflective impervious baffle designed to block direct visible radiation emitted from the light emitter in a directional light source, in order to avoid temporary partial blindness (disability glare) if viewed directly by an observer. It does not include surface coating of the light emitter in the directional light source; | | |
| (44) 'control gear efficiency' is the output power divided by the input power of a separate control gear using the conditions and methods defined in measurement standards. Any lighting control parts and non-lighting parts are disconnected, switched off or set to minimum power consumption according to manufacturer's instructions and subtracting | (44) 'control gear efficiency' is the output power **supplying a light source** divided by the input power of a separate control gear using the conditions and methods defined in measurement standards. Any lighting control parts and non-lighting parts are disconnected, switched off or set to minimum power consumption according to manufacturer's instructions and subtracting | This wording can be made more tangible. |

| | | |
|---|---|---|
| this power consumption from the overall input power; | this power consumption from the overall input power; | |
| (45) 'functionality after endurance testing' means the functionality of a LED or OLED light source after endurance testing as defined in Annex V; | | |
| (46) 'flicker' means the perception of visual unsteadiness induced by a light stimulus the luminance or spectral distribution of which fluctuates with time, for a static observer in a static environment. The fluctuations can be periodic and non-periodic and may be induced by the light source itself, the power source or other influencing factors.<br><br>The metric for flicker used in this Regulation is the 'Pst LM', where 'st' stands for short term and 'LM' for light flickermeter method, as defined in standards. A value Pst LM=1 means that the average observer has a 50% probability of detecting flicker; | | |
| (47) 'stroboscopic effect' means a change in motion perception induced by a light stimulus the luminance or spectral distribution of which fluctuates with time, for a static observer in a non-static environment. The fluctuations can be periodic and non-periodic and may be induced by the light source itself, the power source or other influencing factors.<br><br>The metric for the stroboscopic effect used in this Regulation is the 'SVM' (Stroboscopic Visibility Measure), as defined in standards. SVM=1 represents the visibility threshold for an average observer; | | |
| (48) 'declared value' for a parameter means the value given by the manufacturer or importer in the technical documentation pursuant to point 2 of Annex IV to Directive 2009/125/EC; | | |

| | | |
|---|---|---|
| (49) ‘specific effective radiant ultraviolet power’ (mW/klm) means the effective power of the ultraviolet radiation of a light source weighted according to the spectral correction factors and related to its luminous flux; | | |
| (50) ‘luminous intensity’ (candela or cd) means the quotient of the luminous flux leaving the source and propagated in the element of solid angle containing a given direction, by the element of solid angle; | | |
| (51) ‘correlated colour temperature’ (CCT [K]) means the temperature of a Planckian (black body) radiator whose perceived colour most closely resembles that of a given stimulus at the same brightness and under specified viewing conditions; | | |
| (52) ‘colour consistency’ means the maximum deviation of the initial (after a short period of time), spatially averaged chromaticity coordinates (x and y) of a single light source from the chromaticity centre point (cx and cy) declared by the manufacturer or the importer, expressed as the size (in steps) of the MacAdam ellipse formed around the chromaticity centre point (cx and cy); | | |
| (53) ‘displacement factor (cos φ1)’ means the cosine of the phase angle φ1 between the fundamental harmonic of the mains supply voltage and the fundamental harmonic of the mains current. It is used for mains light sources using LED- or OLED-technology;<br><br>The displacement factor is measured at full-load, for the reference control settings where applicable, with any lighting control parts in control mode and non-lighting parts disconnected, switched off or set to minimum power consumption according to the manufacturer’s instructions; | | |

| | | |
|---|---|---|
| (54) 'lumen maintenance factor' (LMF) means the ratio of the luminous flux emitted by a light source at a given time in its life to the initial luminous flux; | | |
| (55) 'survival factor' (SF) means the defined fraction of the total number of light sources that continue to operate at a given time under defined conditions and switching frequency; | | |
| (56) 'lifetime' for LED and OLED light sources means the time in hours between the start of their use and the moment when for 50% of a population of light sources the light output has gradually degraded to a value below 70% of the initial luminous flux. This is also referred to as the L70B50 lifetime; | | |
| (57) 'equivalent model' means a model with the same relevant technical and performance characteristics as another model placed on the market under a different commercial code; | | |
| (58) 'end-user' means a natural person buying or expected to buy a product for purposes which are outside his trade, business, craft or profession; | | |
| (59) 'photosensitive patients' means people with a specific condition causing photosensitive symptoms and who experience adverse reactions to natural and/or certain forms of artificial lighting technology; | | |
| (60) 'projected light-emitting surface area (A)' is the surface area in $mm^2$ (square millimetres) of the view in an orthographic projection of the light-emitting surface from the direction with the highest light intensity, where the light-emitting surface area is the surface area of the light source that emits light with the declared optical characteristics, such as the approximately spherical surface of an arc (a), cylindrical surface of a filament coil | | |

| | | |
|---|---|---|
| (b) or a gas discharge lamp (c, d), flat or semi-spherical envelope of a light-emitting diode (e). | | |
| For light sources with a non-clear envelope or with anti-glare shield, the light-emitting surface area is the entire area through which light leaves the light source.<br><br>For light sources containing more than one light emitter, the projection of the smallest gross volume enveloping all emitters shall be taken as the light-emitting surface. | | |
| For HID light sources definition (a) applies, unless the dimensions defined in (d) apply with L>D, where L is the distance between the electrode tips and D the inner diameter of the arc tube.<br>  <br>(a) $A=\frac{1}{4}\pi D^2$ (b) $A=L\cdot D$ (c) $A=L\cdot D$ (d) $A=L\cdot D$ (e) $A=\frac{1}{4}\pi D^2$ | | |
| **NEW** | (61) **"high-luminance light source" means a light source comprising one or more discrete light emitting elements, each having a luminous emittance greater than 100/R lm/mm2, based on the projected light-emitting surface area A from definition (55), where R=(CRI+80)/160** | Earlier proposals for high luminance light sources were not taken into account in the draft. High-luminance light sources are a key element for directional lighting applications (e.g. spotlights, roadway lighting and stadium lighting). High-luminance light sources enable narrower beam angles with smaller optics, resulting in more light delivered on target, energy savings, volume reduction (miniaturisation) and cost savings. High-luminance LED light sources have intrinsic efficacy penalties at source level, but these are offset at application level by the higher light use efficiency enabled by the small source size, yielding a net energy benefit. A bonus is therefore required to maintain high-luminance light sources on the market. |

| | | |
|---|---|---|
| **ANNEX II – Ecodesign requirements**<br><br>For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the Official Journal of the European Union, or other reliable, accurate and reproducible methods, which takes into account the generally recognised state-of-the-art. | | |
| 1. Energy efficiency requirements: | | |
| (a) From 1 September 2021, the declared power consumption of a light source at full-load Pon shall not exceed the maximum allowed power Ponmax (in W), defined in function of the declared useful luminous flux Φuse (in lm) and the declared colour rendering index CRI (-) as follows:<br>**Ponmax = C * (L + Φuse / (F*η)) * R** | **Maintain current efficiency requirements and review need for regulatory action at a later time.** | LightingEurope and market users request a realistic timeline for the phase-out of these products – 2021 is too early. There are not enough alternatives available. A premature ban will create unnecessary costs and waste.<br><br>Missing lines for halogen G9, G4, and GY6.35. LightingEurope and market users request a realistic timeline for the phase-out of these products – 2021 is too early. Halogen G9, G4, GY6.35 currently do not have (nor will have in the near future) LED retrofit solution, therefore they should be kept on the market. |
| Where:<br>– The values for threshold efficacy (η in lm/W) and end loss factor (L in W) are specified in Table 1, depending on the light source type. They are constants used for computations and do not reflect true parameters of light sources. The threshold efficacy is not the minimum required efficacy; the latter can be computed by dividing the useful luminous flux by the computed maximum allowed power. | | |
| – Basic values for correction factor (C) depending on light source type, and additions to C for special light source features are specified in Table 2. | | |

<table>
<tr>
<td>– Efficacy factor (F) is:<br>1,00 for non-directional light sources (NDLS, using total flux)<br>0,85 for directional light sources (DLS, using flux in a cone)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– CRI factor (R) is:<br>0,65 for CRI ≤ 25<br>(CRI+80)/160 for CRI > 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Table 1 – Threshold efficacy (η) and end loss factor (L)<br><br>
<table>
<tr><th>Light source description</th><th>η<br>[lm/W]</th><th>L<br>[W]</th></tr>
<tr><td>LFL T5-HE</td><td>98,8</td><td>1,9</td></tr>
<tr><td>LFL T5-HO, 4000≤Φ≤5000 lm</td><td>83,0</td><td>1,9</td></tr>
<tr><td>LFL T5-HO, other lm output</td><td>79,0</td><td>1,9</td></tr>
<tr><td>FL T5 circular</td><td>79,0</td><td>1,9</td></tr>
<tr><td>FL T8 other than LFL 2-, 4- and 5-foot (incl. FL T8 U-shaped)</td><td>89,7</td><td>4,5</td></tr>
<tr><td>FL using magnetic induction, any length/flux</td><td>70,2</td><td>2,3</td></tr>
<tr><td>CFLni</td><td>70,2</td><td>2,3</td></tr>
<tr><td>FL T9 circular</td><td>71,5</td><td>6,2</td></tr>
<tr><td>HPS single-ended</td><td>88,0</td><td>50,0</td></tr>
<tr><td>HPS double-ended</td><td>78,0</td><td>47,7</td></tr>
<tr><td>MH ≤ 405 W single-ended</td><td>84,5</td><td>7,7</td></tr>
<tr><td>MH > 405 W single-ended</td><td>79,3</td><td>12,3</td></tr>
<tr><td>MH ceramic double-ended</td><td>84,5</td><td>7,7</td></tr>
<tr><td>MH quartz double-ended</td><td>79,3</td><td>12,3</td></tr>
</table>
</td>
<td>Table 1 – Threshold efficacy (η) and end loss factor (L)<br>Change and add as follow:<br>
<table>
<tr><th>Light source description</th><th>η<br>[lm/W]</th><th>L<br>[W]</th></tr>
<tr><td>FL T8 ~~other than LFL 2-, 4- and 5-foot~~ (incl. FL T8 U-shaped)</td><td>89.7</td><td>4.5</td></tr>
<tr><td>HL MV capsules G9</td><td>19.5</td><td>7.7</td></tr>
<tr><td>HL LV capsules G4 and GY6.36</td><td>19.5</td><td>7.7</td></tr>
</table>
</td>
<td>A too quick phase-out implies possible mistakes/inappropriate solutions in retrofitting for many specific applications such as e.g. lighting systems under ATEX EU legislations, lighting in trains, etc. The transition shall be smoother to have suitable retrofit solutions capability enough to meet the request from the market and keep legislation/lighting requirements at system level.<br><br>LightingEurope and market users request a realistic timeline for the phase-out of these products – 2021 is too early. There are not enough alternatives available. A premature ban will create unnecessary costs and waste. Maintain current efficiency requirements and review need for regulatory action at a later time.<br><br>Retrofit solutions are not available for the lamp types and applications involved so the proposed date does not ensure a correct lamp replacement. Many customers require these lamps for a longer time, e.g. the railroads.<br><br>The halogen lamps (HL MV Capsules G9 and HL LV Capsules G4 and GY6.36) currently do not have (nor will have in the near future) LED retrofit solution, so they should not be phased out from the market until true LED retrofit lamps are available.</td>
</tr>
</table>

<table>
<tr>
<td>
<table>
<tr><td>Organic light-emitting diode (OLED)</td><td>65,0</td><td>1,5</td></tr>
<tr><td>HL R7s ≤ 2700 lm</td><td>26,0</td><td>13,0</td></tr>
<tr><td>Other light sources in scope not mentioned above</td><td>120,0</td><td>1,5*</td></tr>
</table>
* For connected light sources (CLS) a factor L=2,0 shall be applied.
</td>
<td></td>
<td></td>
</tr>
<tr>
<td>
Table 2 - Correction factor C depending on light source characteristics
<table>
<tr><th>Light source type</th><th>Basic C value</th></tr>
<tr><td>Non-directional (NDLS) not operating on mains (NMLS)</td><td>1</td></tr>
<tr><td>Non-directional (NDLS) operating on mains (MLS)</td><td>1,08</td></tr>
<tr><td>Directional (DLS) not operating on mains (NMLS)</td><td>1,15</td></tr>
<tr><td>Directional (DLS) operating on mains (MLS)</td><td>1,23</td></tr>
<tr><td></td><td></td></tr>
<tr><th>Special light source feature</th><th>Bonus on C</th></tr>
<tr><td>FL or HID with CCT >5000 K</td><td>+0,10</td></tr>
<tr><td>FL with CRI > 90</td><td>+0,10</td></tr>
<tr><td>HID with second envelope</td><td>+0,10</td></tr>
<tr><td>MH NDLS >405 W with non-clear envelope</td><td>+0,10</td></tr>
<tr><td>DLS with anti-glare shield</td><td>+0,20</td></tr>
<tr><td>Colour-tuneable light source (CTLS)</td><td>+0,10</td></tr>
</table>
</td>
<td>
Table 2 - Correction factor C depending on light source characteristics<br><br>
Add bonus:<br>High-luminance light source C+0.5
<table>
<tr><th>Special light source feature</th><th>Bonus on C</th></tr>
<tr><td>High-luminance light source</td><td>+0,5</td></tr>
</table>
</td>
<td>Earlier proposals for high luminance light sources were not taken into account in the draft. High-luminance light sources are a key element for directional lighting applications (e.g. spotlights, roadway lighting and stadium lighting). High-luminance light sources enable narrower beam angles with smaller optics, resulting in more light delivered on target, energy savings, volume reduction (miniaturisation) and cost savings. High-luminance LED light sources have intrinsic efficacy penalties at source level, but these are offset at application level by the higher light use efficiency enabled by the small source size, yielding a net energy benefit. A bonus is therefore required to maintain high-luminance light sources on the market.</td>
</tr>
<tr>
<td>Where applicable, bonuses on correction factor C are cumulative.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light sources that allow the end-user to adapt the spectrum and/or the beam angle of the emitted light, thus changing the values for useful luminous flux, CRI and/or correlated colour temperature (CCT), and/or changing the DLS/NDLS status,</td>
<td></td>
<td></td>
</tr>
</table>

shall be evaluated using the reference control settings, at full-load.

The standby power Psb of a light source shall not exceed 0.5 W.

The networked standby power Pnet of a connected light source shall not exceed 0.5 W.

The allowable values for Psb and Pnet shall not be added together.

(b) From 1 September 2021, the values set in Table 3 for the minimum energy efficiency requirements of separate control gear operating at full-load shall apply:

**Table 3 – Minimum efficiency for separate control gear at full-load**

| **Declared output power of the control gear (Pcg) or declared power of the light source (Pls) in W, as applicable** | **Minimum efficiency** |
|---|---|
| Control gear for HL light sources | |
| all wattages Pcg | 0,91 |
| Control gear for FL light sources | |
| Pls ≤ 5 | 0,71 |
| 5 < Pls ≤ 100 | Pls/(2*√(Pls /36)+38/36* Pls+1) |
| 100 < Pls | 0,91 |
| Control gear for HID light sources | |
| Pls ≤ 30 | 0,78 |

| | | | |
|---|---|---|---|
| 30 < Pls ≤ 75<br>75 < Pls ≤ 105<br>105 < Pls ≤ 405<br>405 < Pls | 0,85<br>0,87<br>0,90<br>0,92 | | |
| Control gear for LED or OLED light sources<br>all wattages Pcg | Pcg0,81 / (1,09* Pcg0,81+2,10) | | |
| Multi-wattage separate control gears shall comply with the requirements in Table 3 according to the maximum declared power on which they can operate. | | | |
| The no-load power Pno of a separate control gear shall not exceed 0.5 W. This applies only to separate control gear for which the manufacturer or importer has declared in the technical documentation that it has been designed for no-load mode. | | | |
| The standby power Psb of a separate control gear shall not exceed 0.5W. | | | |
| The networked standby power Pnet of a connected separate control gear shall not exceed 0.5 W. The allowable values for Psb and Pnet shall not be summed. | | | |
| 2. Functional requirements:<br>(a) From 1 September 2021, the functional requirements specified in Table 4 shall apply for light sources. | | | |
| **Table 4 – Functional requirements for light sources** | | | |
| Colour rendering | CRI ≥ 80 (except for HID with Φuse > 4 klm and for light sources intended for use in outdoor applications, | | |

| | | | |
|---|---|---|---|
| | industrial applications or other applications where lighting standards allow a CRI<80, when a clear indication to this effect is shown on the light source packaging and in all relevant printed and electronic documentation) | | |
| Displacement factor (DF, cos ϕ1) at power input Pon for LED and OLED MLS | No limit at Pon ≤ 5 W, DF ≥ 0.5 at 5 W < Pon ≤ 10 W, DF ≥ 0.7 at 10 W < Pon ≤ 25 W DF ≥ 0.9 at 25 W < Pon | | |
| Lumen maintenance factor (for LED and OLED) | The lumen maintenance factor XLMF% after endurance testing according to Annex V shall be at least XLMF,MIN% calculated as follows:<br>**XLMF,MIN% = 100* *e*(3000∗ln/(0.7)L70**<br>where L70 is the declared L70B50 lifetime (in hours)<br>Upper limit for XLMF,MIN%: the calculated required lumen maintenance of the sample shall not exceed 96.0% (i.e., XLMF,MIN ≤ 96.0 %) | **Maintain 500 h early failure test OR include UN Model failure test (1,000 h)** | Combined with a required testing cycle of 3,600 hours or 21 weeks (!), this very complex formula goes against the starting point as described in Preamble Paragraph 7: aiming for “better regulations” to facilitate better verification, to reduce the number of parameters from compliance testing, and to decrease the time for test procedures.<br>Question: what does “provisional endurance” test mean? (Annex V, Para. 2)<br><br>"Upper limit for XLMF,MIN% is not clearly explained. For instance if we have a product that has a L70B50 lifetime of 50,000 h  XLMF,MIN% = 97.9 % Upper limit for XLMF,MIN% is 96 %... Is a product with 50,000 h lifetime not complying with the Regulation? "<br><br>The calculation of the maintenance factor at 3,000 hrs from the L70B50 value assumes a perfect exponential decay of the luminous flux. The is seldom the sare in reality. We therefore propose to relate the maintenance factor to the luminous flux after the 100 h conditioning period. |

| | | |
|---|---|---|
| | | The formula is actually same as Energystar. But Energystar allows 3 % tolerance in surveillance to cover the measurement uncertainty.<br><br>Additionally, this requirement introduce 3,600 h testing. Which is a great burden to the economic operator. Even type testing is not mandatory in EU, other countries (especially Middle East) will enforce the 3,600 h type testing when they coping regulation from EU (this is consistent practice in the last years).<br><br>To ensure market surveillance authorities operating tests should be short; the same for manufacturers, in view also to the time to market and for all types of products covered by this Regulation (i.e. for products specifically designed on customer request). |
| Survival factor (for LED and OLED) — Light sources should be operational as specified in Annex IV Table 6, following the endurance testing given in Annex V. | Survival factor (for LED and OLED) — Light sources should be operational as specified in **row "Survival Factor (for LED and OLED)" of** Annex IV**,** Table 6, following the endurance testing given in Annex V. | We suggest to make clearer that operational does not mean that all initial performances must be met after the endurance test.<br><br>This is equal to a lifetime of 3,600 hours - no longer minimum lifetime required. |
| Colour consistency for LED and OLED light sources — Variation of chromaticity coordinates within a six-step MacAdam ellipse or less. | **Skip x,y tolerance**<br><br>**3 samples: the determined number of steps shall not exceed the declared number of MA ellipses steps. Centre of ellipses shall be the centre declared by the supplier with a tolerance of 0.01 units**<br><br>**10 samples: the determined number of steps shall not exceed the declared number of MA ellipses steps. Centre of ellipses shall be the centre declared by the supplier with a tolerance of 0.005 units**<br><br>**See also comments to: Annex IV, Table 6** | Next to the remarks made above related to Better Regulation and the Preamble paras. 7 and 17 – 0.01 or 0.005 units are not even measurable – these two requirements related to colour consistency and colour point contradict each other:<br>1. These are two different and conflicting measurements for the same topic: colour consistency<br>2. Shape does not match: MacAdam ellipses have the shape of an ellipse, chromaticity coordinates result in a square shape<br>Does not fit with the requirements in Table 4: Table 6 should support the measurement of the |

| | | |
|---|---|---|
| | | performance criteria from Table 4 (one can only compare a MacAdam ellipse)<br>The remarks made above related to Better Regulation and the Preamble paras. 7 and 17 also apply here – the aim of the current legislation is to simplify the present regulatory framework and to set out requirements that are easy to understand, apply and to enforce<br><br>The allowed deviation from the declared value is not consistent with the functional demand on the colour variation expressed as the 6 step MacAdam ellipse. The size of this ellipse depends on the location of the colour point. This fact expresses the sensitivity of the human eye for colour differences at different colour temperatures. |
| Flicker for LED and OLED MLS \| Pst LM ≤ 1.0 at full-load | ~~Flicker for LED and OLED MLS~~ \| ~~Pst LM ≤ 1.0 at full-load~~ | Instead of a few parameters that can be well enforced, a long list of unnecessary parameters is introduced of which some are not yet fully defined nor measurable, like flicker and stroboscopic effects. This conflicts with paras. 7 and 17 of the Preamble: to reduce the number of parameters for compliance testing and to allow measurements through reliable, accurate, and reproducible measurements methods. Furthermore, some outdoor and some indoor lighting applications do not need such requirements. |
| Stroboscopic effect for LED and OLED MLS \| SVM ≤ 1.6 at full-load | ~~Stroboscopic effect for LED and OLED MLS~~ \| ~~SVM ≤ 1.6 at full-load~~ | Idem. |
| 1. Information requirements:<br>(a) Information to be displayed on the light source itself. | ~~1.~~ **3.** Information requirements | Editorial mistake |
| For all light sources, except CTLS, LFL, CFLni, other FL, and HID, the value and physical unit of the useful luminous flux (lm) and correlated colour temperature (K) | | |

| | | |
|---|---|---|
| shall be displayed in a legible font on the surface if, after the inclusion of safety-related information, there is sufficient space available for it without unduly obstructing the light emission. | | |
| For directional light sources the beam angle (˚) shall also be indicated. | | |
| If there is room for only two values, the useful luminous flux and the correlated colour temperature shall be displayed. If there is room for only one value, the useful luminous flux shall be displayed. | | |
| (b) Information to be visibly displayed on the packaging | | |
| (1) Light sources:<br><br>Light sources in scope of this Regulation are in scope of Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2017/1369 with regard to energy labelling for light sources. As concerns the information to be visibly displayed on the packaging of light sources, manufacturers and importers shall apply the requirements set out in Annex XXX of Commission Delegated Regulation (EU) …/… | | |
| (2) Separate control gears:<br><br>If a separate control gear is placed on the market as a stand-alone product and not as a part of a containing product, in a packaging containing information to be visibly displayed to potential buyers, prior to their purchase, the following information shall also be clearly and prominently displayed on the packaging: | | |

| | | |
|---|---|---|
| (a) the maximum output power of the control gear (for HL, LED and OLED) or the power of the light source for which the control gear is intended (for FL and HID); | | |
| (b) the type of light source(s) for which it is intended; | | |
| (c) the efficiency in full-load, expressed in percentage; | | |
| (d) the no-load power (Pno), expressed in W and rounded to the second decimal, or the indication that the gear is not intended to operate in no-load mode. If the value is zero, it may be omitted from the packaging but shall anyway be declared in the technical documentation and on websites; | | |
| (e) the standby power (Psb), expressed in W and rounded to the second decimal. If the value is zero, it may be omitted from the packaging but shall anyway be declared in the technical documentation and on websites; | | |
| (f) the networked standby power (Pnet), expressed in W and rounded to the second decimal. If the value is zero, it may be omitted from the packaging but shall anyway be declared in the technical documentation and on websites; | | |
| (g) a warning if the control gear is not suitable for dimming of light sources, or can be used only with specific types of dimmable light sources or using specific wired or wireless dimming methods. In the latter cases, detailed information on the conditions in which the control gear | | |

| | | |
|---|---|---|
| can be used for dimming shall be provided on the manufacturer's or importer's website; | | |
| (h) a QR-code redirecting to a website optimized for mobile devices, or the internet address for a website, where full information on the control gear can be found; | | |
| (i) The information does not need to use the exact wording on the list above. In addition, it may be displayed in the form of graphs, drawings or symbols. | | |
| (c) Information to be visibly displayed on a free-access website | | |
| (1) Light sources:<br><br>Light sources in scope of this Regulation are in scope of Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2017/1369 with regard to energy labelling for light sources. As concerns the information to be visibly displayed on a free-access website, manufacturers and importers shall apply the requirements set out in Annex V of Commission Delegated Regulation (EU) …/… in relation to the product database set out in Article 4 of Regulation (EU) 2017/1369. | | |
| (2) Separate control gears:<br><br>For any separate control gear that is placed on the market, the following information shall be displayed on at least one free-access website, including a website optimized for mobile devices. For separate control gears to which requirement 3.2.2(h) applies, the latter website shall be linked to a QR-code on the packaging: | | |

| | | |
|---|---|---|
| (a) The information specified in point 3.2.2, except 3.2.2(h); | | |
| (b) The outer dimensions in mm; | | |
| (c) The mass in grams of the control gear, without packaging, and without lighting control parts and non-lighting parts, if any and if they can be physically separated from the control gear; | | |
| (d) Instructions how to remove lighting control parts and non-lighting parts, if any, or how to switch them off or minimize their power consumptions during control gear testing: | | |
| (e) If it can be used with dimmable light sources, a list of minimum characteristics that the light sources should have to fully compatible with the control gear during dimming, and possibly a list of compatible dimmable light sources; | | |
| (f) Recommendations on how to dispose of it at the end of its life for recycling in line with Directive 2012/19/EU. | | |
| The information does not need to use the exact wording in the list above. In addition, it may be displayed in the form of graphs, drawings or symbols. | | |
| Information on separate control gears that are no longer in production or that are not or no longer intended for sale in the European Union should be clearly marked as such and/or moved to a separate section of the website. | | |
| The same information shall also be contained in the technical documentation file drawn up for the | | |

| | | |
|---|---|---|
| purposes of conformity assessment pursuant to Article 8 of Directive 2009/125/EC. | | |
| (d) Technical documentation<br><br>Light sources in scope of this Regulation are in scope of Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2017/1369 with regard to energy labelling for light sources. The technical documentation for the purposes of conformity assessment pursuant to Article 5 shall include the information in the order and as set out in Table 6 of Regulation [*Please insert here references of the specific energy labelling regulation*]. For market surveillance purposes, manufacturers may refer to the technical documentation uploaded to the product database which contains the same information as per Regulation [*Please insert here references of the specific energy labelling regulation*]. | | |
| (e) Information for products specified in Annex I point 3<br><br>For the light sources and separate control gears specified in Annex I point 3, the intended purpose shall be stated on all forms of packaging, product information and advertisement, together with an explicit indication that the light source is not intended for use in other applications.<br><br>In particular for light sources indicated in Annex I point 3 (p), it shall be stated: "This light source is only for use by photo sensitive patients. Use of this light source will lead to increased energy cost compared to an equivalent more energy efficient product." | (e) Information for products specified in Annex I point 3<br><br>For the light sources and separate control gears specified in Annex ~~I~~ **III** point 3, the intended purpose shall be stated on all forms of packaging, product information and advertisement, together with an explicit indication that the light source is not intended for use in other applications.<br><br>In particular for light sources indicated in Annex ~~I~~ **III** point 3 (p), it shall be stated: "This light source is only for use by photo sensitive patients. Use of this light source will lead to increased energy cost | Correct numbering. |

| | | |
|---|---|---|
| | compared to an equivalent more energy efficient product." | |
| **ANNEX III - Exemptions** | | |
| 1. This Regulation shall not apply to light sources and separate control gears specifically tested and approved to operate: | | |
| (a) in potentially explosive atmospheres as defined in Directive 2014/34/EU3 of the European Parliament and of the Council; | | |
| (b) for emergency use as set out in Directive 2014/35/EU of the Council and the Parliament4; | | |
| (c) in radiological and nuclear medicine installations, as defined in Article 3 of Directive 2009/71/EURATOM5; | | |
| (d) in or on military or civil defence establishments, equipment, ground vehicles, marine equipment or aircraft as set out in Member States' Regulations or in documents issued by the European Defence Agency; | | |
| (e) in or on motor vehicles, their trailers and systems, components and separate technical units intended therefore, as set out in Regulation (EC) No 661/20096, Regulation (EU) No 167/20137, Regulation (EU) No 168/20138 and their amendments; | | |
| (f) in or on non-road mobile machinery intended as set out in Regulation (EU) 2016/1628/EU9 and their amendments; | | |
| (g) in or on civil aviation aircrafts as set out in Commission Regulation (EU) No 748/201210; | | |
| (h) in railway vehicle lighting as set out in Directive 2008/57/EC11 and its amendments, as well as relevant Member State legislation; | | |

| | | |
|---|---|---|
| (i) in marine equipment as set out in Council Directive 2014/90/EU12 and its amendments or recasts; | | |
| (j) in medical devices as set out in Council Directive 93/42/EEC13 and in vitro medical devices as set out in Directive 98/79/EC14 and their amendments. | | |
| For the purpose of this point, 'specifically tested and approved' means that the light source or separate control gear:<br>(1) has been specifically tested for the mentioned operating condition or application, according to the European legislation mentioned or related implementing acts, relevant Member State legislation, and/or relevant European or international standards, and | | |
| (2) is accompanied by evidence, in the form of a certificate, a type approval mark, a test report or other documentation, that the product has been specifically approved for the mentioned operating condition or application, and | | |
| (3) is placed on the market specifically for the mentioned operating condition or application, as evidenced at least by the technical documentation, information on the packaging and any advertising or marketing materials. | | |
| 2. In addition, this Regulation shall not apply to:<br>(a) double capped fluorescent T5 light sources with power P ≤ 13 W; | | |
| (b) electronic displays (e.g. televisions, computer monitors, notebooks, tablets, mobile phones, e-readers, game consoles), including but not limited to displays in scope of Commission | | |

| | | |
|---|---|---|
| Regulation (EU) No 617/201315, Commission Decision (EU) 2015/140216, Commission Regulation (EC) No 642/200917, Commission Decision (EU) 2016/175618, European Commission COM(2015)17819; | | |
| (c) Range hoods in the scope of Commission Delegated Regulation (EU) No 65/2014; | | |
| (d) light sources and separate control gears in battery-operated products, including but not limited to e.g. torches, mobile phones with integrated torch light, toys including light sources, desk lamps operating only on batteries, armband lamps for cyclists, solar-powered garden lamps; | | |
| (e) light sources and separate control gears in bicycles and other non-motorized vehicles. | | |
| 3. Any light source or control gear in scope of this Regulation shall be exempt from the requirements of Annex III, with the exception of the information requirements set out in Annex III point 3.5, if it has a specific technical design for its intended use in at least one of the following applications: | 3. Any light source or control gear in scope of this Regulation shall be exempt from the requirements of Annex ~~III~~ **II**, with the exception of the information requirements set out in Annex ~~III~~ **II** point 3~~.5~~**(e)**, if it has a specific technical design for its intended use in at least one of the following applications: | Correct reference. |
| (a) signalling (including, but not limited to, road-, railway-, marine- or air traffic-signalling, traffic control or airfield lamps); | | |
| (b) image capture and image projection (including, but not limited to, photocopying, printing (directly or in pre-processing), lithography, film and video projection, holography); | | |
| (c) light sources with specific effective ultraviolet power >2 mW/klm and intended for use in applications requiring high UV-content; | | |

| | | |
|---|---|---|
| (d) light sources with a peak radiation around 253.7 nm and intended for germicidal use (destruction of DNA); | | |
| (e) light sources emitting 5 % or more of total radiation power of the range 250-800 nm in the range of 250-315 nm and/or 20 % or more of total radiation power of the range 250-800 nm in the range of 315-400 nm, and intended for disinfection or fly trapping; | | |
| (f) light sources with the primary purpose of emitting radiation around 185.1 nm and intended to be used for the generation of ozone; | | |
| (g) light sources emitting 40 % or more of total radiation power of the range 250-800 nm in the range of 400-480 nm, and intended for coral zooxanthellae symbioses; | | |
| (h) FL light sources emitting 80 % or more of total radiation power of the range 250-800 nm in the range of 250-400 nm, and intended for sun-tanning; | | |
| (i) HID light sources emitting 40 % or more of total radiation power of the range 250-800 nm in the range of 250-400 nm, and intended for sun-tanning; | | |
| (j) light sources with a photosynthetic efficacy >1.2 µmol/J, and/or emitting 25 % or more of total radiation power of the range 250-800 nm in the range of 700-800 nm, and intended for use in horticulture; | | |
| (k) HID light sources with correlated colour temperature CCT > 7000 K and intended for use in applications requiring such a high CCT; | | |

| | | |
|---|---|---|
| (l) halogen light sources with a beam angle of less than 10˚ and intended for spot-lighting applications requiring a very narrow light beam; | ~~Halogen light~~ **Light** sources with a beam angle of less than 10 degrees and intended for spotlighting applications requiring a very narrow light beam | This should include all technologies: in line with previous drafts and in order to avoid backsliding from LED to halogen. This is amongst others relevant for architectural lighting. |
| (m) halogen light sources with cap-type G9.5, GX9.5, GY9.5, GZ9.5, G9.5HPL, G16d, GX16, GX16d, GY16, G22, G38, GX38, GX38Q, P28s, P40s, PGJX50, QXL, designed and marketed specifically for scene-lighting use in film-studios, TV-studios, and photographic-studios, or for stage-lighting use in theatres, discos and during concerts or other entertainment events; | (m) ~~halogen~~ light sources with cap-type G9.5, GX9.5, GY9.5, GZ9.5, G9.5HPL, G16d, GX16, GX16d, GY16, G22, G38, GX38, GX38Q, P28s, P40s, PGJX50, QXL, ***R7s***, and ***RX7s*** designed and marketed specifically for scene-lighting use in film-studios, TV-studios, and photographic-studios, or for stage-lighting use in theatres, discos and during concerts or other entertainment events; | Delete halogen so that the exemption is applicable for the HID stage and studio lighting as well. |
| (n) colour-tuneable light sources that can be set to at least the colours mentioned in table below and have for each of these colours, measured at the dominant wavelength, a minimum colour purity index according to table below, and intended for use in applications requiring high-quality coloured light:<br>Colour Dominant wave-length range Minimum colour purity index<br>Blue 440nm – 490nm 90 %<br>Green 520nm – 540nm 65 %<br>Red 610nm – 670nm 95 % | | |
| (o) light sources accompanied by an individual calibration certificate detailing the exact radiometric flux and/or spectrum under specified conditions, and intended for use in photometric calibration (of e.g. wavelength, flux, colour temperature, colour rendering index), or for laboratory use during the evaluation of coloured surfaces and materials under standard | | |

| | | |
|---|---|---|
| viewing conditions (e.g. standard illuminants); | | |
| (p) light sources provided specifically for use by photosensitive patients, to be sold in pharmacies and other authorised selling points like disability products suppliers on presentation of a medical prescription; | | |
| (q) incandescent light sources (not including halogen light sources) fulfilling all of the following conditions: power ≤40 W, length ≤60 mm, diameter ≤30mm, declared suitable for operation at ambient temperature ≥300 °C, and intended for use in high temperature applications such as ovens; | | |
| (r) halogen light sources fulfilling all of the following conditions: cap-type G4, GY6.35 or G9, power ≤60 W, declared suitable for operation at ambient temperature ≥300 °C, and intended for use in high temperature applications such as ovens; | | |
| (s) light sources and separate control gears intended for operation at ambient temperatures below -30 °C. | | |
| **NEW** | **(t) Definition of work-of-art (as in Directive 2001/84/EC)** | Work-of-art light sources and luminaires are made in low quantities (e.g. 1 or 3 pieces only), which makes the added costs of testing for verification of compliance with eco-design and energy labelling requirements too expensive. |
| **NEW** | **(u) Halogen light sources with blade contact, metal lug, cable or litz wire connection or non-standard customised cap designed and marketed for industrial or professional electro-heating equipment (e.g. stretch blow-moulding process in PET-Industry, 3D-printing, gluing, inks, paint and coating hardening)** | There are no LED substitutes available for various lighting applications in industry |

| | | |
|---|---|---|
| **NEW** | **(v) Halogen light sources with R7s cap and a correlated colour temperature between 2300-2500 K for industrial or professional electro-heating equipment (e.g. stretch blow-moulding process in PET-Industry, 3D-printing, gluing, inks, paint and coating hardening)** | There are no LED substitutes available for various lighting applications in industry |
| **NEW** | **(w) Halogen light sources with R7s cap with total length > 180 mm for professional customers** | There are no LED substitutes available for various lighting applications in industry |
| **NEW** | **(x) Halogen light sources with R7s and Rx7s caps with efficacy >/= 24 lm/W and rated lifetime B50 </= 300 h e.g. for studio, theatre and film/movie applications** | There are no LED substitutes available for various lighting applications in industry. |
| **NEW** | **(y) Fluorescent light sources with 2G11 cap and white light with CCT ≥ 5,500 K and power < 60 W and life is ≤ 2,000 h, CRI: >85 and fluorescent light sources with 2G11 cap and white light with CCT ≤ 3,200 K and power < 60 W and life is ≤ 2,000 h, CRI: > 90, as both are designed and marketed specifically for scene lighting in film studios, TV studios, and photographic studios, or for stage lighting in theatres, discos, concerts, and other entertainment events.** | There are no LED substitutes available for various lighting applications in industry (they have been exempted from Reg. 245/2009 as well). |
| **NEW** | **(z) light sources composed by clusters of LED in a matrix distribution with clearance among them of at least 3 times the LED/chips largest dimension (diagonal for a square or rectangular chip), and whose light output per area is above 264 lm/mm²**<br><br>**The light output is calculated as the light source lumen output** | Any white LED source for studio and theatre lighting is missing, regardless whether they are high luminance light sources or whether the operating conditions are different from general lighting usage. Two specific cases are considered representing entertainment applications, and based on them two exemptions criteria are proposed.<br><br>High luminance light engine (profiles, beam, spot fixtures); fixtures that adopt light sources based on SSL chip clusters: |

| | | |
|---|---|---|
| | **The area is calculated as the sum of the light emitting area of each emitter** | - in which a clearance among emitters is needed to use optics on top of them to collect light and get much more than 100 lm/mm²<br>- with power from 20 W till values above 1 kW |
| **NEW** | **(aa) Exempt dense clustered SSL light sources in a matrix with spacing among emitter less than the emitter largest dimension with**<br>- **at least 30 lm/mm²: 1) light output is calculated as the light source lumen output, 2) the area is calculated as either the outer perimeter of the poligon or circle including all emitting LED/chips or 3) in the case of COB, the declared light emitting area**<br>- **power package above 100 W** | Any white LED source for studio and theatre lighting is missing, regardless whether they are high luminance light sources or whether the operating conditions are different from general lighting usage. Two specific cases are considered representing entertainment applications, and based on them two exemptions criteria are proposed.<br><br>Dense clustered light sources (Fresnel, Pebble, PC soft spot fixtures): light sources based on high dense LED/chip clusters (minimum clearance among LEDs/chips) to replace discharge lamps or halogen lamps from 0.5 kW till 5 kW in soft spot fixtures. This requires:<br>- High power light sources (>100 W)<br>- Compact dimensions: this high luminance corresponds to > 30 lm/mm² lambertian emitters (FWHM 120º) |
| **NEW** | **(bb) Infrared colourless light sources for infra-red radiator/luminaire with customised geometry and bases and limited share of white light used for temperature transformation processes, with generally white light with CCT ≤ 3,000 K and power ≥ 100 W** | These special purpose lamps are missing from the list, please add them. CCT can be lowered to 2,500 K, if 3,000 is a problem. |
| **NEW** | **(cc) Incandescent lamps ≤ 25 W and ≤ 60 mm length and ≤ 30 mm diameter, resistant to mechanical shock & vibrations for sewing machine and hoover.** | These special purpose lamps are missing from the list, please add them. They are need for the replacement market. |
| **Annex IV – Verification procedure for market surveillance purposes**<br><br>The verification tolerances defined in this Annex relate only to the verification of the measured | | |

| | | |
|---|---|---|
| parameters by Member State authorities and shall not be used by the manufacturer or importer as an allowed tolerance to establish the values in the technical documentation or in interpreting these values with a view to achieving compliance or to communicate better performance by any means. | | |
| When verifying the compliance of a product model with the requirements laid down in this Regulation pursuant to Article 3(2) of Directive 2009/125/EC, the authorities of the Member States shall apply the following procedure: | | |
| 1. The Member State authorities shall verify one single unit of the model for 2(a) and 2(b).<br><br>The Member State authorities shall verify 10 units of the light source model or 3 units of the separate control gear model for 2(c). For light sources, if the acquisition costs for the 10 units would exceed 500 euros, Member State authorities may reduce the sample size to 3 units. The verification tolerances are laid down in Table 6 | 1. The Member State authorities shall verify one single unit of the model for 2(a) and 2(b).<br><br>The Member State authorities shall verify 10 units of the light source model or 3 units of the separate control gear model**, supplied from at least two different sources,** for 2(c). For light sources, if the acquisition costs for the 10 units would exceed 500 euros, Member State authorities may reduce the sample size to 3 units. The verification tolerances are laid down in Table 6 | Keep the original LightingEurope comment and proposal to have a realistic sample. |
| 2. The model shall be considered to comply with the applicable requirements if: | | |
| (a) the values given in the technical documentation pursuant to point 4 of Annex II to Directive 2009/125/EC (declared values), and, where applicable, the values used to calculate these values, are not more favourable for the manufacturer or importer than the results of the corresponding measurements carried out pursuant to paragraph (g) thereof; and | (a) the values given in the technical documentation pursuant to point ~~4~~ **2** of Annex ~~II~~ **IV** to Directive 2009/125/EC (declared values), and, where applicable, the values used to calculate these values, are not more favourable for the manufacturer or importer than the **averaged** results of the corresponding measurements carried **by manufacturer or importer** out pursuant to paragraph (g) thereof; and | Corrected reference and clarified text to avoid confusing and misinterpretation. |
| (b) the declared values meet any requirements laid down in this Regulation, | | |

| | | |
|---|---|---|
| and any required product information published by the manufacturer or importer does not contain values that are more favourable for the manufacturer or importer than the declared values; and | | |
| (c) when the Member State authorities test the units of the model, the determined values comply with the respective verification tolerances as given in Table 6, where 'determined value' means the arithmetical mean over the tested units of the measured values for a given parameter or the arithmetical mean of parameter values calculated from other measured values. | | |
| 3. If the results referred to in point 2(a) or (b) are not achieved, the model and all models that have been listed as equivalent models in the manufacturer's or importer's technical documentation shall be considered not to comply with this Regulation. | | |
| 4. If the result referred to in point 2(c) is not achieved, the model and all models that have been listed as equivalent models in the manufacturer's or the importer's technical documentation shall be considered not to comply with this Regulation. | | |
| 5. The Member State authorities shall provide all relevant information to the authorities of the other Member States and to the Commission without delay after a decision being taken on the non-compliance of the model according to points 3 and 4. | | |
| The Member State authorities shall use the measurement and calculation methods set out in Annex II. | | |
| The Member State authorities shall only apply the verification tolerances that are set out in Table 6 and shall use only the procedure described in this Annex. No other tolerances, such as those set out | | |

| | | |
|---|---|---|
| in harmonised standards or in any other measurement method, shall be applied. | | |
| **Table 6**<br><br>**Parameter** / **Sample Size** / **Verification tolerances**<br>**Full-load on-mode power Pon [W]:**<br>Pon ≤ 2W — 3 — The determined value shall not exceed the declared value by more than 0.20 W<br>Pon ≤ 2W — 10 — The determined value shall not exceed the declared value by more than 0.20 W<br>2W < Pon ≤ 5W — 3 — The determined value shall not exceed the declared value by more than 10 %<br>2W < Pon ≤ 5W — 10 — The determined value shall not exceed the declared value by more than 10 %<br>5W < Pon ≤ 25W — 3 — The determined value shall not exceed the declared value by more than 10 %.<br>5W < Pon ≤ 25W — 10 — The determined value shall not exceed the declared value by more than 5 %.<br>25W < Pon ≤ 100W — 3 — The determined value shall not exceed the declared value by more than 7.5 %. | | |

| | | | | | |
|---|---|---|---|---|---|
| | 10 | The determined value shall not exceed the declared value by more than 5 %. | | | |
| 100W < Pon | 3 | The determined value shall not exceed the declared value by more than 5 %. | | | |
| | 10 | The determined value shall not exceed the declared value by more than 2.5 %. | | | |
| **Displacement factor [*0-1*]** | 3 | The determined value shall not be less than the declared value minus 0.1 units | | | |
| | 10 | The determined value shall not be less than the declared value minus 0.1 units. | | | |
| **Useful luminous flux Φuse [*lm*]** | 3 | The determined value shall not exceed the declared value by more than 10 %. | **Useful luminous flux Φuse [*lm*]** | 3 | The determined value shall not exceed the declared value by more than 10 %. | The tolerance should be 10 % regardless of sample size. The luminous flux measurement of lamps does have an intrinsic uncertainty of 10 % coming from testing equipment, test procedure and lamp-to-lamp variations. Decreasing the samples number from 20 to 10 could lead to an additional uncertainty of test values, so tolerances should not be further decreased.<br><br>Measurement uncertainties for photometric quantities are larger than the electrical ones, i.e. 5 % tolerance is compatible with a standard measurement uncertainty of a testing lab. We think to be wise to enlarge this tolerance to avoid false noncompliance. Other option is adding LAB measurement uncertainty to the verification tolerance. Suppliers of LEDs have a typical |
| | 10 | The determined value shall not exceed the declared value by more than 5 %. | | 10 | The determined value shall not exceed the declared value by more than ~~5~~ **10** ***%.*** | |

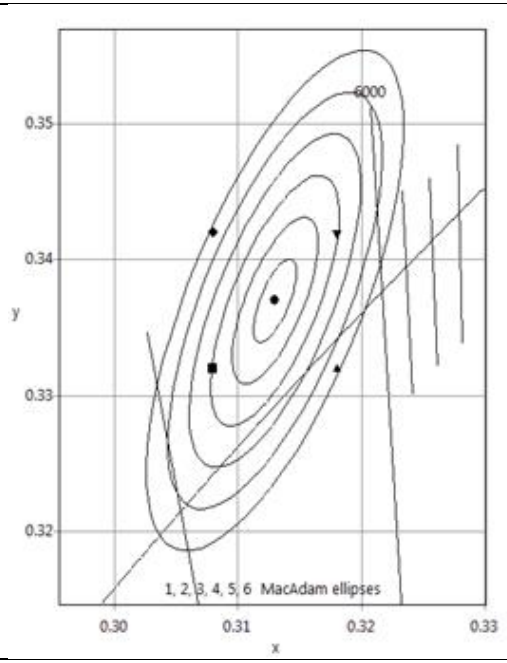
| | | |
|---|---|---|
| | | production tolerance more or equal than 5 %. This 5 % tolerance has to be added to the flux binning. So how can a LED module or a LED light source be more accurate than its basic components? If 10 % tolerance is not accepted we will have a lot of issues also because now the requirement is symmetric (+/-), so there is no room at all to play on declare less than the real rating of the products to gain enough confidence.<br><br>The tolerance for the useful luminous flux, efficacy, CCT should be increased to 10 % regardless of lamp sample size:<br>1. The luminous flux measurement of lamps does have an intrinsic uncertainty of 10 % coming from testing equipment, test procedure and lamp-to-lamp variations.<br>2. Decreasing the samples number from 20 to 10 could lead to an additional uncertainty of test values, so tolerances should not be further decreased.<br>3. Survival factor – since we are talking about statistical data, the wording 'the determined value shall not be less than the declared value" cannot be interpreted in real life. Keep the 10 % as it is in 245/2009.<br>4. The current version does not refer to any harmonised standards concerning the calibration of the verification labs.<br><br>The wording: "The determined value shall not deviate from the declared value by more than 5%" limits the design freedom for LED devices. As the efficacy of LEDs still improves, having both the lower and upper boundary limits the production of LED devices over a longer period. As the efficacy rises the product cannot be maintained in this narrow band. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | The upper limit for a tolerance on the declared value is not appropriated, especially if the %value is so small because the 5 % tolerance is too narrow and only relevant to measurement uncertainty of laboratories. |
| **No-load power Pno, Standby power Psb and Networked standby power Pnet [*W*]** | 3 | The determined value shall not exceed the declared value by more than 0.10 W. | | | | |
| | 10 | The determined value shall not exceed the declared value by more than 0.10 W. | | | | |
| **CRI [*0-100*]** | 3 | The determined value shall not exceed the declared value by more than 3,0 units. | **CRI [*0-100*]** | 3 | The determined value shall not exceed the declared value by more than 3.0 units. | Suppliers of LEDs have a typical production tolerance of 2. So how can a LED module or a LED light source be more accurate than its basic components? |
| | 10 | The determined value shall not exceed the declared value by more than 2,0 units. | | 10 | The determined value shall not exceed the declared value by more than **3.0** ~~2.0~~ units. | |
| **Flicker [*Pst LM*] and Stroboscopic effect [*SVM*]** | 3 | The determined value shall not exceed the declared value by more than 10 %. | ~~**Flicker [*Pst LM*] and Stroboscopic effect [*SVM*]**~~ | ~~3~~ | ~~The determined value shall not exceed the declared value by more than 10 %.~~ | We propose to introduce a shorter list of parameters that can be well-enforced. Our issue with flicker and stroboscopic effect is that no standards exist and that they are difficult to verify. Furthermore, some outdoor and some indoor lighting applications do not need such requirements. |
| | 10 | The determined value shall not exceed the declared value by more than 10 %. | | ~~10~~ | ~~The determined value shall not exceed the declared value by more than 10 %.~~ | |
| **Colour Consistency [*MacAdam ellips steps*]** | 3 | The determined number of steps shall not exceed the declared number of steps. | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 10 | The determined number of steps shall not exceed the declared number of steps. | | | | |
| **Beam angle (*degrees*)** | 3 | The determined value shall not deviate from the declared value by more than 25 % | | | | |
| | 10 | The determined value shall not deviate from the declared value by more than 25 %.. | | | | |
| **Control gear efficiency [*0-1*]** | 3 | The determined value shall not be less than the declared value minus 0,05 units. | | | | |
| | 10 | The determined value shall not be less than the declared value minus 0,025 units | | | | |
| **Efficacy [lm/W]** | 3 | The determined value (quotient) shall not be less than the declared value minus 10 %. | **Efficacy [lm/W]** | 3 | The determined value (quotient) shall not be less than the declared value minus 10 %. | The tolerance should be 10 % regardless of sample size (see the comment about the luminous flux). Why the lm/W came in when both the lm and the W are already separately included? |
| | 10 | The determined value (quotient) shall not be less than the declared value minus 5 %. | | 10 | The determined value (quotient) shall not be less than the declared value minus ~~5~~ **10 *%.*** | |
| **L70B50 lifetime (for LED and OLED)** | 3 | The determined value shall not be less than the declared value minus 20 % | | | | |
| | 10 | The determined value shall not be less than the declared value minus 10 % | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Lumen Maintenance Factor (for LED and OLED)** | 3 | The determined XLMF% of the sample following the test in Annex V shall not be less than XLMF, MIN%.20 | ~~**Lumen Maintenance Factor (for LED and OLED)**~~ | ~~3~~ | ~~The determined XLMF% of the sample following the test in Annex V shall not be less than XLMF, MIN%.20~~ | Delete this and maintain 500 h early failure test. |
| | 10 | | | 10 | | |
| **Survival Factor (for LED and OLED)** | 3 | All 3 light sources of the test sample must be operational after completing the endurance test in Annex V. | ~~**Survival Factor (for LED and OLED)**~~ | ~~3~~ | ~~All 3 light sources of the test sample must be operational after completing the endurance test in Annex V.~~ | Delete this and maintain 500 h early failure test. |
| | 10 | At least 9 light sources of the test sample must be operational after completing the endurance test in Annex V. | | ~~10~~ | ~~At least 9 light sources of the test sample must be operational after completing the endurance test in Annex V.~~ | |
| **Colour Purity Index [%]** | 3 | The determined value shall not be less than the declared value minus 10 % | | | | |
| | 10 | The determined value shall not be less than the declared value minus 5 %. | | | | |
| **Chromaticity coordinates (x,y) [-]** | 3 | The determined x and y values shall not deviate from the declared values by more than 0,01 units | **Chromaticity coordinates ~~(x,y)~~ [-]** | 3 | The determined ~~x and y values shall not deviate from the declared values by more than~~ **number of steps shall not exceed the declared number of MA ellipses steps. Centre of ellipses shall be the centre declared** | We ask to check the chromaticity coordinates with a tolerance of 0.005 is a request that is basically overlapping the colour consistency requirement. There is no need to add this further check. See graph below that show that a variation of 0.005 coordinate at approximately 6,500 K is comparable with a 6 step MacAdam ellipses deviation. Furthermore, chromaticity coordinates are measurable with typical measurement uncertainties of 0.005. Mainly for this reason LED suppliers are delivering their colour binning with additional tolerances >= 0.005. So how can a |
| | 10 | The determined x and y values shall not deviate from the declared values by more than 0,005 units | | | | |

| | | | | |
|---|---|---|---|---|
| | | | **by the supplier with a tolerance of** 0.01 units | LED module or a LED light source be more accurate than its basic components? Anyhow suppliers should indicate what the centre of chromaticity coordinates is. Otherwise there is no way to check the colour consistency in terms of MacAdam ellipses.<br><br>Next to the remarks made above related to Better Regulation and the Preamble paras. 7 and 17 – 0.01 or 0.005 units are not even measurable – these two requirements related to colour consistency and colour point contradict each other:<br>1. These are two different and conflicting measurements for the same topic: colour consistency.<br>2. Shape does not match: MacAdam ellipses have the shape of an ellipse, chromaticity coordinates result in a square shape.<br>Does not fit with the requirements in Table 4: Table 6 should support the measurement of the performance criteria from Table 4 (one can only compare a MacAdam ellipse).<br>The remarks made above related to Better Regulation and the Preamble paras. 7 and 17 also apply here – the aim of the current legislation is to simplify the present regulatory framework and to set out requirements that are easy to understand, apply and to enforce.<br><br>Luminous flux: The introduction of different limits for different samples is considered incorrect. The limits should be identical for 3 or 10 samples. |
| | | 10 | The determined ~~x and y values shall not deviate from the declared values by more than~~ **number of steps shall not exceed the declared number of MA ellipses steps. Centre of ellipses shall be the centre declared by the supplier with a tolerance of** 0.005 units. | |

| | | |
|---|---|---|
| | |  |
| **Correlated Colour Temperature [K]**<br>3<br>The determined value shall not deviate from the declared value by more than 10 %<br>**Correlated Colour Temperature [K]**<br>10<br>The determined value shall not deviate from the declared value by more than 5 % | **Correlated Colour Temperature [K]**<br>3<br>The determined value shall not deviate from the declared value by more than 10 %<br>**Correlated Colour Temperature [K]**<br>10<br>The determined value shall not deviate from the declared value by more than ~~5~~ **10 %** | The tolerance should be 10 % regardless of sample size (see above comments on tolerances). |
| Following Article 4.1, manufacturers and importers of containing products shall ensure that light sources and separate control gears can be removed without being permanently damaged for verification purposes by market surveillance authorities and without permanent damage to the containing product. For containing products, instructions should be available on request on | Following Article 4(1), manufacturers and importers of containing products shall ensure that light sources and separate control gears can be removed without being permanently damaged for verification purposes by market surveillance authorities ~~and without permanent damage to the containing product~~. For containing products, instructions should be available on request on | See comments for Art. 4(1). |

| | | |
|---|---|---|
| how light sources and separate control gears can be removed for verification without these being permanently damaged and without permanent damage to the containing product. | how light sources and separate control gears can be removed for verification without these being permanently damaged ~~and without permanent damage to the containing product~~. | |
| For light sources with linear geometry which are scalable but of very long length, such as LED strips or strings, verification testing of market surveillance authorities shall consider a length of 50 cm, or, if the light source is not scalable there, the nearest value to 50 cm. The light source manufacturer shall indicate which control gear is suitable for this length. | | |
| **Annex V - Functionality after endurance testing**<br><br>Models of LED- and OLED- light sources shall undergo endurance testing to verify their lumen maintenance and survival factor. This endurance testing consists of the test method outlined below. Member State authorities shall test 10 units of the model for this test, however if the acquisition costs for 10 units would exceed EUR 500, Member State authorities have the option to reduce the sample size to 3 units. | **Replace by 500 h early failure test** | |
| The provisional endurance test for LED and OLED light sources shall be conducted as follows: | | It is not clear what is meant with "provisional"; if "optional" is meant, text has to be changed. |
| (a) Ambient Conditions and Test Setup: | | |
| (i) The switching cycles are to be conducted in a room with an ambient temperature of 25 ±10 °C and an average air velocity of less than 0.2 m/s; | | |
| (ii) The switching cycles on the sample shall be conducted in free air in a vertical base-up position. However, if a supplier has declared the light source is suitable for use in a specific orientation only, then the sample shall be mounted in that orientation; | | |
| (iii) The applied voltage during the switching cycles shall have a tolerance within 2 %. | | |

| | | |
|---|---|---|
| The total harmonic content of the supply voltage shall not exceed 3 %. Standards provide guidance on the supply voltage source. | | |
| (b) Provisional Endurance Test Method. | | |
| (i) Initial flux measurement: measure the luminous flux of the light source prior to starting the endurance test switching cycle; | | |
| (ii) Switching cycles: operate the light source for 1200 cycles of repeated, continuous switching cycles without interruption. One complete switching cycle consists of 150 minutes of the light source switched ON at full power followed by 30 minutes of the light source switched OFF. The hours of operation recorded (i.e., 3000 hours) include only the periods of the switching cycle when the light source was switched ON, i.e. the total test time is 3600 hours; | | |
| (iii) Final flux measurement: at the end of the 1200 switching cycles, note if any lamps have failed (see 'Survival Factor' requirements in Annex IV Table 6) and measure the luminous flux of the light sources that have not failed; | | The failing light source is not described. LightingEurope assumes that a failed light source does not emit light anymore. |
| (iv) For each of the units in the sample which have not failed, divide the measured final flux by the measured initial flux. Average the resulting values over all the units that did not fail to compute the determined value for the lumen maintenance factor XLMF%. | | |
| **ANNEX VI – Benchmarks**<br><br>The best available technology on the market, at the time of entry into force of this Regulation, for the environmental aspects that were considered significant and are quantifiable is indicated below. | | |

| | | |
|---|---|---|
| At the time of entry into force of this Regulation, the best available technology on the market for light sources in terms of their efficacy based on useful luminous flux was identified as follows:<br>– Non-directional light sources: 120-140 lm/W<br>– Mains voltage directional light sources: 90-100 lm/W<br>– Extra low voltage directional light sources: 85- 95 lm/W<br>– Linear light sources (tubes): 140-160 lm/W | | |
| At the time of entry into force of this Regulation, the best available technology on the market for separate control gears have an energy efficiency of 95 %. | | |
| Features required in certain applications, e.g. a high colour rendering, might prevent products offering those features from achieving these benchmarks. | | |
| At the time of entry into force of this Regulation, the best available technology on the market for light sources and separate control gears do not have any mercury content. | | |