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**COMMISSION REGULATION (EU) .../...**

**of **XXX****

**laying down ecodesign requirements for light sources and separate control gears  
pursuant to Directive 2009/125/EC of the European Parliament and of the Council**

**and repealing Commission Regulations (EC) No 244/2009, (EC) No 245/2009 and  
(EU) No 1194/2012**

(Text with EEA relevance)

# COMMISSION REGULATION (EU) .../...

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## **laying down ecodesign requirements for light sources and separate control gears pursuant to Directive 2009/125/EC of the European Parliament and of the Council and repealing Commission Regulations (EC) No 244/2009, (EC) No 245/2009 and (EU) No 1194/2012**

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to Article 114 of the Treaty on the Functioning of the European Union,

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 products<sup>1</sup>, and in particular Article 15(1) thereof,

Whereas:

- (1) Pursuant to Directive 2009/125/EC the Commission should set ecodesign requirements for energy-related products which account for significant volumes of sales and trade in the Union and which have a significant environmental impact and presenting significant potential for improvement through design in terms of their environmental impact, without entailing excessive costs.
- (2) The Ecodesign Working Plan 2016-2019<sup>2</sup> established by the Commission in application of Article 16(1) of Directive 2009/125/EC sets out the working priorities under the ecodesign and energy labelling framework for the period 2016-2019. The Working Plan identifies the energy-related product groups to be considered as priorities for the undertaking of preparatory studies and eventual adoption of implementing measures, as well as the review of the current regulations.
- (3) Measures from the Working Plan have an estimated potential to deliver a total in excess of 260 TWh of annual final energy savings in 2030, which is equivalent to reducing greenhouse gas emissions by approximately 100 million tonnes per year in 2030. Lighting is one of the product groups listed in the Working Plan, with an estimated 41.9 TWh of annual final energy savings in 2030.
- (4) The Commission established ecodesign requirements for lighting products in Commission Regulations (EC) No 244/2009<sup>3</sup>, (EC) No 245/2009<sup>4</sup> and (EU)

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<sup>1</sup> OJ L 285, 31.10.2009, p. 10.

<sup>2</sup> COM(2016) 773 final of 30.11.2016.

<sup>3</sup> Commission Regulation (EC) No 244/2009 of 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for non-directional household lamps (OJ L 76, 24.3.2009, p. 3).

<sup>4</sup> Commission Regulation (EC) No 245/2009 of 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able

No 1194/2012<sup>5</sup>. Pursuant to those Regulations the Commission should review them in the light of technological progress.

- (5) The Commission has reviewed those Regulations and analysed the technical, environmental and economic aspects of lighting products as well as real-life user behaviour. The review was carried out 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 shows the benefit of updating the requirements for lighting products and the benefit of simplifying the requirements to be applied to lighting products, in particular by having one single regulation for this product group. This is in line with the Commission's 'Better Regulation' policy and should aim to decrease the 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.
- (7) In accordance with the review, all lighting products that fall within the scope of the three existing regulations should be covered by this Regulation. Furthermore, a uniform formula should be set to calculate the energy efficiency of such lighting products.
- (8) The annual electricity consumption of products subject to this Regulation in the Union was estimated at 336 TWh in 2015. This covers 12.4 % of the overall use of electricity by the 28 Member States and corresponds to 132 million tonnes of CO<sub>2</sub> equivalent greenhouse gas emissions. The energy consumption of lighting products in a business-as-usual scenario is projected to decrease by 2030. However, this reduction is expected to slow down unless the existing ecodesign requirements are updated.
- (9) The environmental aspects of lighting products that have been identified as significant for the purposes of this Regulation are energy consumption in the use phase along with mercury content.
- (10) The use of hazardous substances, including mercury in light sources is governed by Directive 2011/65/EU of the European Parliament and of the Council (RoHS)<sup>6</sup>. No specific ecodesign requirements on mercury content should therefore be set in this Regulation.
- (11) The Commission Communication on the circular economy<sup>7</sup> and the Ecodesign Working Plan 2016-2019 underline the importance of using the ecodesign framework to support the move towards more resource efficient and circular economy. Directive 2012/19/EU<sup>8</sup> of the European Parliament and of the Council refers to Directive

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to operate such lamps, and repealing Directive 2000/55/EC of the European Parliament and of the Council (OJ L 76, 24.3.2009, p. 17).

<sup>5</sup> Commission Regulation (EU) No 1194/2012 of 12 December 2012 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for directional lamps, light emitting diode lamps and related equipment (OJ L 342, 14.12.2012, p. 1).

<sup>6</sup> Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (OJ L 174, 1.7.2011, p. 88, and amendments).

<sup>7</sup> COM/2015/0614 final of 02.12/2015.

<sup>8</sup> Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (OJ L 197, 24.7.2012, p. 38).

2009/125/EC and indicates that ecodesign requirements should facilitate the re-use, dismantling and recovery of waste of electrical and electronic equipment (WEEE) by tackling the issues upstream. The WEEE Directive sets requirements for separate collection and recycling of lighting products, with new provisions from August 2018. This Regulation should therefore not lay down further requirements for this.

- (12) Specific requirements for the standby and networked standby electric power demand of lighting products should be laid down. Therefore, the requirements of Commission Regulation (EC) No 1275/2008<sup>9</sup> should not apply to lighting products covered by the scope of this Regulation.
- (13) 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.
- (14) 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.
- (15) The relevant product parameters should be measured using reliable, accurate and reproducible methods. Those methods should take into account 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 1025/2012 of the European Parliament and of the Council<sup>10</sup>.
- (16) In accordance with Article 8 of Directive 2009/125/EC, this Regulation should specify the applicable conformity assessment procedures.
- (17) 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 Delegated Regulation (EU) *[OP please insert the references of the Regulation 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.
- (18) Commission Regulation (EU) 2016/2282<sup>11</sup> requires this Regulation to specify tolerance values for lighting parameters and adopt the approach of declared values.

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<sup>9</sup> OJ L 339, 18.12.2008, p 45

<sup>10</sup> Regulation (EU) No 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardisation, amending Council Directives 89/686/EEC and 93/15/EEC and Directives 94/9/EC, 94/25/EC, 95/16/EC, 97/23/EC, 98/34/EC, 2004/22/EC, 2007/23/EC, 2009/23/EC and 2009/105/EC of the European Parliament and of the Council and repealing Council Decision 87/95/EEC and Decision No 1673/2006/EC of the European Parliament and of the Council (OJ L 316, 14.11.2012, p. 12).

<sup>11</sup> Commission Regulation (EU) 2016/2282 of 30 November 2016 amending Regulations (EC) No 1275/2008, (EC) No 107/2009, (EC) No 278/2009, (EC) No 640/2009, (EC) No 641/2009, (EC) No 642/2009, (EC) No 643/2009, (EU) No 1015/2010, (EU) No 1016/2010, (EU) No 327/2011, (EU) No 206/2012, (EU) No 547/2012, (EU) No 932/2012, (EU) No 617/2013, (EU) No 666/2013, (EU) No 813/2013, (EU) No 814/2013, (EU) No 66/2014, (EU) No 548/2014, (EU) No 1253/2014, (EU) 2015/1095, (EU) 2015/1185, (EU) 2015/1188, (EU) 2015/1189 and (EU) 2016/2281 with regard to the use of tolerances in verification procedures (OJ L 346, 20.12.2016, p. 51).

- (19) To improve the effectiveness of this Regulation and to protect consumers, products that automatically alter their performance in test conditions to improve the declared parameters should be prohibited.
- (20) 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 products' environmental performance over their life cycle subject to this Regulation widely available and easily accessible, in accordance with Directive 2009/125/EC, Annex 1, part 3, point 2.
- (21) 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.
- (22) Regulations (EC) No 244/2009, (EC) No 245/2009 and (EU) No 1194/2012 should therefore be repealed.
- (23) 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,

HAS ADOPTED THIS REGULATION:

#### *Article 1*

#### **Subject matter and scope**

1. This Regulation establishes ecodesign requirements for the placing on the market of
  - (a) light sources;
  - (b) separate control gears;
 as defined in Article 2.  
 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.e.

#### *Article 2*

#### **Definitions**

For the purpose of this Regulation, the following definitions shall apply:

- (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
 
$$0,270 < x < 0,530$$
 and
 
$$-2,3172 x^2 + 2,3653 x - 0,2199 < y < -2,3172 x^2 + 2,3653 x - 0,1595;$$
  - (b) a luminous flux  $< 500 \text{ lm per mm}^2$  of projected light-emitting surface area as defined in Annex I;
  - (c) a luminous flux between 60 and 82 000 lumen;

(d) a colour rendering index (CRI)  $R_a > 0$ ;

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 IV.

High-pressure sodium light sources that do not fulfil condition (a) are considered light sources for the purposes of this Regulation.

Light sources do not include:

- (a) LED dies or LED chips;
- (b) LED packages;
- (c) products containing light source(s) from which these light source(s) can be removed for verification;
- (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, that can be or not physically integrated in a light source, intended to prepare the mains 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.

The term ‘control gear’ does not include power supplies within the scope of Commission Regulation (EC) No 278/2009<sup>12</sup>. 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.

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). If a containing product cannot be taken apart for verification of the light source and separate control gear, the entire containing product is to be considered a light source;
- (5) ‘light’ means electromagnetic radiation with a wavelength between 380 nm and 780 nm;
- (6) ‘mains’ or ‘mains voltage’ (MV) means the electricity supply of 230 ( $\pm 10$  %) Volt of alternating current at 50 Hz;

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<sup>12</sup> OJ L93, 7.4.2009, p.3.

- (7) 'LED die' or 'LED chip' means a small block of light-emitting semiconducting material on which a functional LED circuit is fabricated;
- (8) 'LED package' means a single electric part comprising principally at least one LED die. It does not include a control gear or parts of it, a cap, active electronic components and is not connected directly to the mains voltage. 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;
- (9) 'chromaticity' means the property of a colour stimulus defined by its chromaticity coordinates (x and y);
- (10) 'luminous flux' or 'flux' ( $\Phi$ ), 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 refers to the total flux emitted by a light source in a solid angle of  $4\pi$  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;
- (11) 'colour rendering index' (CRI) 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 and is the average Ra of the colour rendering for the first 8 test colours (R1-R8) defined in standards;
- (12) '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 include GLS – general lamp shape light sources and halogen light sources;
- (13) 'halogen light source' means an incandescent light source with a threadlike conductor made from tungsten surrounded by gas containing halogens or halogen compounds;
- (14) '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;
- (15) '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. HID light sources are limited to metal halide, high-pressure sodium and mercury vapour types, as defined in Annex I;

- (16) ‘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;
- (17) ‘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;
- (18) ‘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;
- (19) ‘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.

For the purposes of the Annexes, additional definitions are set out in Annex I.

#### *Article 3*

#### **Ecodesign requirements**

Products within the scope of this Regulation shall comply with the ecodesign requirements set out in Annex II.

#### *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. For containing products, instructions shall be available on request on how light sources and separate control gears can be removed for verification without these being permanently damaged.
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 packaging, at least in the form of a pictogram, and in the user instructions.

#### *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.
2. For the purposes of the conformity assessment pursuant to Article 8 of Directive 2009/125/EC, the technical documentation shall contain the information set out in



Annex II, point 3(d) to this Regulation and the results of the calculations in accordance with Annex II, points 1 and 2 to this Regulation.

3. 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 technical documentation shall include details of such calculations or extrapolations, or both, and of tests carried out by manufacturers to verify the accuracy of the calculations undertaken.

#### *Article 6*

### **Verification procedure for market surveillance purposes**

Member States shall apply the verification procedure laid down 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**

The manufacturer or importer shall not place on the market products designed in such a way that a model's performance is automatically altered under test conditions with the aim 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.

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 prior to the update.

#### *Article 8*

### **Indicative benchmarks**

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*

### **Review**

The Commission shall review this Regulation in the light of technological progress and shall present the results of this review, including, if appropriate, a draft revision proposal, to the Consultation Forum no later than *[OP – please insert date - five years after its entry into force]*.

This review shall in particular assess:

- (a) setting more stringent energy efficiency requirements for all light source types, in particular for non-LED light source types, and for separate control gears;
- (b) setting requirements on lighting control parts;
- (c) setting more stringent requirements on flicker and stroboscopic effects;
- (d) setting requirements on dimming, including the interaction with flicker;
- (e) setting more stringent requirements on (networked) standby power;

- (f) lowering or abolishing the power bonus for colour-tuneable light sources and removing the exemption for high colour purity;
- (g) substituting the CRI colour rendering metric by a more adequate metric;
- (h) verifying the adequacy of lumen as a stand-alone metric for the quantity of visible light;
- (i) setting additional resource efficiency requirements for products in accordance with the principles of the circular economy.

*Article 10*

**Repeal**

Regulations (EC) No 244/2009, (EC) No 245/2009 and (EU) No 1194/2012 are repealed with effect from 1 September 2021.

*Article 11*

**Entry into force and application**

This Regulation shall enter into force on the twentieth day following that of its publication in the Official Journal of the European Union.

It shall apply from 1 September 2021.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels,

*For the Commission*  
Jean-Claude JUNCKER  
*The President*