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## ANNEX II

Technical parameters covered and definitions for the purposes of Annexes I and III to VII

### 1. Technical parameters for ecodesign requirements

[<sup>F1</sup>.....]

#### Textual Amendments

**F1** Deleted by Commission Regulation (EU) No 347/2010 of 21 April 2010 amending Commission Regulation (EC) No 245/2009 as regards the ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps (Text with EEA relevance).

- (a) ‘Luminous efficacy of a source’, ‘light source efficacy’ or ‘lamp efficacy’ ( $\eta_{\text{source}}$ ), which means the quotient of the luminous flux emitted ( $\Phi$ ) by the power consumed by the source ( $P_{\text{source}}$ ).  $\eta_{\text{source}} = \Phi / P_{\text{source}}$ . Unit: lm/W. The power dissipated by auxiliary equipment such as ballasts is not included in the power consumed by the source.
- (b) ‘Lamp Lumen Maintenance Factor’ (LLMF), which means the ratio of the luminous flux emitted by the lamp at a given time in its life to the initial luminous flux.
- (c) ‘Lamp Survival Factor’ (LSF), which means the fraction of the total number of lamps which continue to operate at a given time under defined conditions and switching frequency.
- [<sup>F2</sup>For the purposes of Table 6 in Annex III, the LSF shall be measured in high frequency operating mode with a switching cycle of 1h/1h.]
- (d) ‘Ballast efficiency’ ( $\eta_{\text{ballast}}$ ), which means the ratio between the lamp power (ballast output) and the input power of the lamp-ballast circuit with possible sensors, network connections and other auxiliary loads disconnected.
- (e) ‘Chromaticity’, which means the property of a colour stimulus defined by its chromaticity coordinates, or by its dominant or complementary wavelength and purity taken together.
- (f) ‘Luminous flux’, which means a quantity derived from radiant flux (radiant power) by evaluating the radiation according to the spectral sensitivity of the human eye.
- (g) ‘Correlated Colour Temperature’ ( $T_c$  [K]), which means 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.
- (h) ‘Colour rendering’ ( $R_a$ ), which means the effect of an illuminant on the colour appearance of objects by conscious or subconscious comparison with their colour appearance under a reference illuminant.
- (i) ‘Specific effective radiant UV power’, which means the effective power of the UV radiation of a lamp related to its luminous flux (unit: mW/klm).
- (j) ‘Ingress protection grading’, which means a coding system to indicate the degree of protection provided by an enclosure against ingress of dust, solid objects and moisture and to give additional information in connection with such protection.

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### Textual Amendments

**F2** Inserted by Commission Regulation (EU) No 347/2010 of 21 April 2010 amending Commission Regulation (EC) No 245/2009 as regards the ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps (Text with EEA relevance).

2. Technical parameters for indicative benchmarks
  - (a) ‘Lamp mercury content’, which means the amount of mercury contained in the lamp.
  - (b) ‘Luminaire Maintenance Factor’ (LMF), which means the ratio of the light output ratio of a luminaire at a given time to the initial light output ratio.
  - (c) ‘Utilisation Factor’ (UF) of an installation for a reference surface, which means the ratio of the luminous flux received by the reference surface to the sum of the individual total fluxes of the lamps of the installation.
3. Definitions
  - (a) ‘Directional Light Source’ (DLS) means light sources having at least 80 % light output within a solid angle of  $\pi$  sr (corresponding to a cone with angle of 120 °).
  - (b) ‘White light source’ means a light source having chromaticity coordinates that satisfy the following requirement:
    - $0,270 < x < 0,530$
    - $-2,3172 x^2 + 2,3653 x - 0,2199 < y < -2,3172 x^2 + 2,3653 x - 0,1595$
  - (c) A ‘rated’ value means a quantity value for a characteristic of a product for operating conditions specified in this Regulation or in applicable standards. Unless stated otherwise, all product parameter limits are expressed in rated values.
  - (d) A ‘nominal’ value means an approximate quantity value used to designate or identify a product.
  - (e) ‘Light pollution’ means the sum of all adverse impacts of artificial light on the environment, including the impact of obtrusive light.
  - (f) ‘Obtrusive light’ means the part of the light from a lighting installation that does not serve the purpose for which the installation was designed. It includes:
    - light improperly falling outside the area to be lit,
    - diffused light in the neighbourhood of the lighting installation,
    - sky glow, which is the brightening of the night sky that results from the direct and indirect reflection of radiation (visible and non-visible), scattered from the constituents of the atmosphere (gas molecules, aerosols and particulate matter) in the direction of observation.
  - (g) ‘Efficiency Base ballast’ (EBb) means the relationship between the rated lamp power ( $P_{\text{lamp}}$ ) and the ballast efficiency.

For ballasts for single and double capped fluorescent lamps, the  $EBb_{\text{FL}}$  is calculated as follows:

$$\text{When } P_{\text{lamp}} \leq 5 \text{ W : } EBb_{\text{FL}} = 0,71$$

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When  $5 \text{ W} < P_{\text{lamp}} < 100 \text{ W}$  :  $EBb_{\text{FL}} = P_{\text{lamp}} / (2 * \sqrt{P_{\text{lamp}} / 36} + 38 / 36 * P_{\text{lamp}} + 1)$

When  $P_{\text{lamp}} \geq 100 \text{ W}$  :  $EBb_{\text{FL}} = 0,91$

- (h) ‘Second lamp envelope’ means a second outer lamp envelope which 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 lamp envelope, the arc tubes of high intensity discharge lamps shall not count as a lamp envelope.
- (i) ‘Light source control gear’ means one or more components between the supply and one or more light sources which may serve to transform the supply voltage, limit the current of the lamp(s) to the required value, provide starting voltage and preheating current, prevent cold starting, correct power factor or reduce radio interference. Ballasts, halogen convertors and transformers and Light Emitting Diode (LED) drivers are examples of light source control gears.
- (j) ‘High-pressure mercury (vapour) lamp’ means a high intensity discharge lamp in which the major portion of light is produced, directly or indirectly, by radiation from mercury operating at a partial pressure in excess of 100 kilopascals.
- (k) ‘High-pressure sodium (vapour) lamp’ means a high intensity discharge lamp in which the light is produced mainly by radiation from sodium vapour operating at a partial pressure of the order of 10 kilopascals.
- (l) ‘Metal halide lamp’ means a high intensity discharge lamp 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.
- (m) ‘Electronic or high frequency ballast’ means a mains supplied a.c. to a.c. inverter, including stabilising elements for starting and operating one or more tubular fluorescent lamps, generally at high frequency.
- (n) ‘Clear lamp’ means a high-intensity discharge lamp with a transparent outer envelope or outer tube in which the light producing arc tube is clearly visible (e.g. clear glass lamp).
- (o) [F2‘Blended lamp’ means a lamp containing a mercury vapour lamp and an incandescent lamp filament connected in series in the same bulb.]

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**Changes and effects yet to be applied to :**

- Regulation revoked by [S.I. 2021/1095 reg. 19\(b\)](#)

**Changes and effects yet to be applied to the whole legislation item and associated provisions**

- Annex 1 para. 2(b) substituted by [S.I. 2019/539 Sch. 2 para. 4\(6\)\(b\)](#)
- Annex 1 para. 2(c) substituted by [S.I. 2019/539 Sch. 2 para. 4\(6\)\(c\)](#)
- Annex 1 para. 2(e)(f) substituted for Annex 1 para. 2(e) by [S.I. 2019/539 Sch. 2 para. 4\(6\)\(d\)](#)
- Annex 1 para. 1 words substituted by [S.I. 2019/539 Sch. 2 para. 4\(6\)\(a\)](#)
- Annex 1 para. 2(b) words substituted in earlier amending provision [S.I. 2019/539, Sch. 2 para. 4\(6\)\(b\)](#) by [S.I. 2020/1528 reg. 4](#)
- Annex 1 para. 2(c) words substituted in earlier amending provision [S.I. 2019/539, Sch. 2 para. 4\(6\)\(c\)](#) by [S.I. 2020/1528 reg. 4](#)
- Annex 1 para. 2(e) words substituted in earlier amending provision [S.I. 2019/539, Sch. 2 para. 4\(6\)\(d\)](#) by [S.I. 2020/1528 reg. 4](#)
- Annex 1 para. 2(f) words substituted in earlier amending provision [S.I. 2019/539, Sch. 2 para. 4\(6\)\(d\)](#) by [S.I. 2020/1528 reg. 4](#)
- Annex 3 para. 1.3 words substituted by [S.I. 2019/539 Sch. 2 para. 4\(7\)\(a\)](#)
- Annex 3 para. 2.2 words substituted by [S.I. 2019/539 Sch. 2 para. 4\(7\)\(b\)](#)
- Annex 3 para. 3.2 words substituted by [S.I. 2019/539 Sch. 2 para. 4\(7\)\(c\)](#)