

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 13. November 2017

Entwurf der EU-Kommission für eine Regelung mit Anforderungen an die Energieverbrauchskennzeichnung von Lichtquellen

– Anhang –

Hinweis: Bitte beachten Sie, daß der angehängte Text nur in Englisch verfaßt ist. Vorangestellt ist aber ein vom UBA eingefügtes Inhaltsverzeichnis in Deutsch.

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 13 November 2017

Draft of the EU Commission on a regulation as regards energy labelling of light sources

– Annex –

Notice: A content list has been added by UBA.

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 13 novembre 2017

Projet de la Commission Européenne pour une réglementation des exigences relatives à l'étiquetage énergétique de sources lumineuses

– Annexe –

Indication: Veuillez noter que le présent texte n'est disponible qu'en anglais. Mais antéposé par l'UBA, il y a une table des matières en français.

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

Liste der von der EU-Kommission am 13. November 2017 versandten Dokumente und Kennzeichnung des vorliegenden Textes

EN: List of the documents, sent out by EU-Commission on 13 November 2017 and identification of the text at hand

FR: Liste des documents qui la Commission européenne a envoyé le 13 Novembre 2017 et marquage de le présent document

- **Begründung** ◇ **EN:** Explanatory memorandum ◇ **FR :** Mémoire explicatif

Entwurf für Anforderungen an die umweltgerechte Produktgestaltung ◇ **EN:** Draft for ecodesign requirements ◇ **FR:** Projet d'exigences d'écoconception

- Haupttext ◇ **EN:** Main text ◇ **FR :** Texte principal
- Anhang ◇ **EN:** Annex ◇ **FR :** Annexe

Entwurf für Anforderungen an die Energieverbrauchskennzeichnung ◇ **EN:** Draft for energy labelling requirements ◇ **FR :** Projet d'exigences sur étiquetage énergétique

- Haupttext ◇ **EN:** Main text ◇ **FR :** Texte principal
- Anhang ◇ **EN:** Annex ◇ **FR :** Annexe

Inhaltsverzeichnis ◊ EN: Contents list → page IV ◊ FR: Table des matières
→ page V

Anhang I: Ausnahmen	2
Anhang II: Begriffsbestimmungen	4
Anhang III: Etikett für Lichtquellen.....	10
Anhang IV: Energieeffizienzklassen und Berechnungsmethode	2
Tabelle 1	2
Tabelle 2: Faktor F_{TM} zu Berechnung von $\eta_{TM} = (\Phi_{Nutz} / P_{on}) * F_{TM}$ (lm/W)	2
Anhang V: Produktinformation	3
1. Produktdatenblatt	3
2. Technikunterlagen.....	3
3. Informationen, die auf der Verpackung anzugeben sind	3
3.1. Lichtquellen als nichteingebaute Produkte	3
3.2. Lichtquellen als eingebaute Produkte	4
4. Informationen, die in der Produktdatenbank einzugeben sind, die mit Verordnung (EU) 2017/1369 eingerichtet wurde	5
4.1. Der öffentliche Teil der Produktdatenbank	5
4.2. Der Konformitätsteil der Produktdatenbank.....	6
5. Informationsanforderungen an die im Anhang I, Punkt 3 genannten Produkte	7
Anhang VI: Informationen, die im Falle von Fernabsatz anzugeben sind, außer dem über Internetz	8
Anhang VII: Informationen, die im Falle von Fernabsatz über Internetz anzugeben sind.....	9
Anhang VIII: Nachprüfungsverfahren zur Marktaufsicht.....	11
Tabelle 4: Toleranzen bei der Nachprüfung	12
Anhang IX: Angabe der Energieeffizienzkasse und des Bereiches der Energie- effizienzklassen in visueller Werbung und in Werbematerialien	14

EN: Contents list

Annex I: Exemptions.....	2
Annex II: Definitions.....	4
Annex III: Label for light sources	10
Annex IV: Energy efficiency classes and calculation method	2
Table 1	2
Table 2: Factors F_{TM} to be used for determination of $\eta_{TM} = (\Phi_{use} / P_{on}) * F_{TM}$ (Im/W).....	2
Annex V: Product information	3
1. Product information sheet	3
2. Technical documentation	3
3. Information to be placed on the packaging	3
3.1. Light source as an independent product	3
3.2. Light source in a containing product	4
4. Information to be entered in the product database established by Regulation (EU) 2017/1369	5
4.1. Public part of the product database.....	5
4.2. Compliance part of the product database.....	6
5. Information for products specified in Annex I point 3	7
Annex VI: Information to be provided in the case of distance selling, except distance selling on the Internet.....	8
Annex VII: Information to be provided in the case of distance selling through the Internet	9
Annex VIII: Verification procedure for market surveillance purposes.....	11
Table 4: Verification tolerances	12
Annex IX: Displaying the energy class and the range of efficiency classes in visual advertisements and in promotional material	14

FR: Table des matières

Annexe I: Exemptions	2
Annexe II: Définitions	4
Annexe III: Étiquetage pour sources lumineuses.....	10
Annexe IV: Classes d'efficacité énergétique et méthode de calcul	2
Tableau 1	2
Tableau 2: Facteur F_{TM} pour déterminer $\eta_{TM} = (\Phi_{utile} / P_{on}) * F_{TM}$ (lm/W).....	2
Annexe V: Information relative au produit.....	3
1. Fiche d'information sur le produit	3
2. Documentation technique	3
3. Informations à faire figurer sur l'emballage	3
3.1. Source lumineuse comme un produit indépendant.....	3
3.2. Source lumineuse comme un produit intégrée.....	4
4. Informations qui doivent être entrés dans la base de données, été créée sur la base du règlement (UE) 2017/1369.....	5
4.1. Partie de la base de données, accessible au public	5
4.2. Partie de la base de données, relative à la conformité	6
5. Exigences d'information applicables aux produits précisées à l'annexe I point 3	7
Annexe VI: Informations à fournir dans le cas de vente à distance, sauf sur l'internet.....	8
Annexe VII: Informations à fournir dans les cas de vente à distance sur l'internet.....	9
Annexe VIII: Procédure de vérification aux fins de la surveillance du marché.....	11
Tableau 4: Tolérances utilisées dans la vérification.....	12
Annexe IX: Afficher les classes d'efficacité énergétique dans publicité visuelle et dans matériel de promotion	14

Es folgt ein unveränderter Originaltext.

EN: The following is an unmodified original text.

FR: Ce qui suit est un texte original.

DRAFT OF
ANNEXES

COMMISSION DELEGATED REGULATION (EU) .../...

supplementing Regulation (EU) 2017/1369 of the European Parliament and of the Council with regard to energy labelling of light sources

This draft has not been adopted or endorsed by the European Commission. Any views expressed are the preliminary views of the Commission services and may not in any circumstances be regarded as stating an official position of the Commission. The information transmitted is intended only for the Member State or entity to which it is addressed for discussions and may contain confidential and/or privileged material.

ANNEX I

Exemptions

1. This Regulation shall not apply to light sources specifically tested and approved to operate:
 - (a) in or on motor vehicles, their trailers and systems, components and separate technical units intended therefore as set out in Regulation No 661/2009¹, Regulation (EU) No 168/2013² and their amendments;
 - (b) in or on civil aviation aircrafts as set out in Commission Regulation 748/2012³;
 - (c) in railway vehicle lighting as set out in Directive 2008/57/EC⁴ and its amendments, as well as relevant Member State legislation;
 - (d) in marine equipment as set out in Council Directive 2014/90/EU⁵ and its amendments or recasts;
 - (e) in or on military or civil defence ground vehicles, marine equipment or aircraft as set out in Member States' Regulations or in documents issued by the European Defence Agency.

For the purpose of this point, 'specifically tested and approved' means that the light source:

- 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
- 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
- is placed on the market specifically for the mentioned operating condition or application, as evidenced at least by the technical documentation, and possibly by information on the packaging and/or in publicity.

2. In addition, this Regulation shall not apply to:

- (a) 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 617/2013⁶, Commission Decision (EU) 2015/1402⁷, Commission Regulation (EC) No 642/2009⁸, Commission Decision (EU) 2016/1756⁹, European Commission COM(2015)178¹⁰.

¹ OJ L 200, 31.7.2009, p.1-24

² OJ L 60, 2.3.2013, p. 52

³ OJ L 224, 21.8.2012, p. 1-85

⁴ OJ L 191, 18.7.2008, p.1-45.

⁵ OJ L 257, 28.8.2014, p. 146–185

⁶ OJ L 175, 27.6.2013, p.13 (computers)

⁷ OJ L 217, 18.8.2015, p.9 (office equipment, computers)

⁸ OJ L 191, 23.7.2009, p.42 (televisions)

⁹ OJ L 268, 1.10.2016, p.90 (office equipment, displays)

¹⁰ COM(2015) 178 final, 22.4.2015 (related to self-regulatory initiative regarding game consoles)

- (b) light sources in portable battery-operated containing 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.
 - (c) light sources on bicycles and other non-motorized vehicles.
 - (d) light sources that do not comply with requirements becoming applicable in 2020 according to Regulations implementing Directive 2009/125/EC of the European Parliament and of the Council.
3. Any light source in scope of this Regulation shall be exempt from the requirements of Articles 3 and 4, with the exception of Annex V.5, if it has a specific technical design for its intended use in at least one of the following applications:
- (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, photocopiers and video projectors).

For these products, the information requirements of Annex V.5 apply.

ANNEX II

Definitions

The following definitions apply in addition to those in Article 2 of the main text:

- (1) '*mains light source (MLS)*' means a light source that can be operated directly on the mains electricity supply. Examples include incandescent light sources designed to operate directly on the mains, light sources with physically integrated control gear.

Light sources that can operate both directly on the mains, and indirectly on the mains using a separate control gear, shall be considered to be mains light sources. E.g. tubular LED light sources intended to replace linear FL, by-passing or keeping the existing FL control gear.

- (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 but they are placed on the market without such control gear. Examples include extra-low-voltage light sources, light sources for operation on power-over-ethernet, and LED-, OLED-, HID- and FL- light sources placed on the market without control gear.

- (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) '*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°)

- (5) '*non-directional light source*' (NDLS) means a light source that is not a directional light source.

- (6) '*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.' To maintain the reference control settings the data-connection parts cannot be disconnected, switched-off or their power consumption minimised.

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 as a single product.

- (7) '*data-connection parts*' means parts that perform one of the following functions:
- reception or transmission of wired or wireless data signals and the processing thereof (either used to control the light emission function or otherwise),
 - sensing and processing of the sensed signals (either used to control the light emission function or otherwise),
 - actuation by audio control (including voice control),
 - a combination of these.

- (8) '*colour-tuneable light source*' (CTLS) means a connected light source (CLS) using LED- or OLED-technology, that can be set to emit light with a large variation of colours outside the range defined in article 2 (1)(a), but can also be set to emit white light inside the range defined in article 2 (1)(a) for which the light source is in scope of this Regulation.

The term does not include tuneable-white light sources that can only be set to emit light, with different colour temperatures, within the range defined in article 2 (1)(a).

The term also does not include dim-to-warm light sources, that shift their white light output to lower colour temperature when dimmed, simulating the behaviour of incandescent light sources.

- (9) '*lighting control parts*' means parts that are integrated in a light source, or physically separated but marketed together with a light source as a single product, that are not strictly necessary for the light source to emit light at full-load, but that enable manual or automatic, direct or remote, control of luminous intensity, chromaticity, 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 devices within the scope of Commission Regulation (EC) No 1275/2008¹¹.

- (10) '*non-lighting parts*' means parts that are integrated in a light source, or physically separate but marketed together with a light source as a single product, that are not necessary for the light source 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)
- (11) '*useful luminous flux*' (Φ_{use}), means the part of the luminous flux of a light source that is considered when determining its energy efficiency:
- 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 $\geq 90^\circ$ 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 $< 90^\circ$ it is the flux emitted in a solid angle of 0.586π sr (corresponding to a cone with angle of 90°).
- (12) '*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.
- For light sources that have different beam angles in different planes, the largest beam angle shall be considered.
- For light sources with user-controllable beam angle, the beam angle corresponding to the '*reference control setting*' shall be considered.
- (13) '*full-load*' means:
- the condition of a light source, within the declared operating conditions, in which it is emitting the maximum (undimmed) initial luminous flux, or
 - the operating conditions and loads of the control gear under efficiency measurement as specified in the relevant standards.

¹¹ OJ L 339, 18.12.2008, p. 45 and later amendments.

- (14) '*standby mode*' means the condition of a light source, where it is connected to the power supply but the light sources are intentionally not emitting light, and the light source is awaiting a control signal 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.
- (15) '*networked standby mode*' means the condition of a connected light source (CLS) where it is connected to the power supply but the light source is intentionally not emitting light, and is awaiting a remotely initiated trigger 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.
- (16) '*control mode*' means the condition of lighting control parts where they are connected to the light source and performing their functions in such a way that a lighting control signal can be internally generated or an external control signal can be received, by wire or wireless, and processed to lead to a change in the light emission of the light source.
- (17) '*control signal*' means an analogue or digital signal transmitted to light source wirelessly or wired either via voltage modulation in separate control cables or via a modulated signal in the supply voltage.
- (18) '*remotely initiated trigger*' means a signal that comes from outside the light source via a network.
- (19) '*network*' means a communication infrastructure with a topology of links, an architecture, including the physical components, organisational principles, communication procedures and formats (protocols).
- (20) '*on-mode power*' (P_{on}), 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 manufacturer's instructions.

In case of a non-mains light source (NMLS) that requires a separate control gear to operate, P_{on} can be measured directly on the input to the light source, or P_{on} is determined using a control gear with known efficiency, whose electric power consumption is subsequently subtracted from the measured mains power input value.

- (21) '*standby power*' (P_{sb}), expressed in Watt, is the electric power consumption of a light source in standby mode.
- (22) '*networked standby power*' (P_{net}), expressed in Watt, is the electric power consumption of a connected light source in networked standby mode.
- (23) '*reference control settings*' 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, colour temperature, spectrum, and/or beam angle of the emitted light.

The reference control settings shall be those predefined by the supplier 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.

The light source supplier shall define the reference control settings such that:

- the light source is in scope of this Regulation according to Art.2(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);
- when the end-user opts to reset factory defaults, the reference control settings are obtained.

- (24) '*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.
- (25) '*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.
- (26) '*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).
- (27) '*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.
- (28) '*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)
- (29) '*LFL T5-HE*' means a high-efficiency linear fluorescent T5 light source with driving current lower than 0.2 A.
- (30) '*LFL T5-HO*' means a high-output linear fluorescent T5 light source with driving current higher than or equal to 0.2 A.
- (31) '*HL R7s*' is a mains-voltage, double capped, linear halogen light source with a cap-diameter of 7 mm.
- (32) '*portable battery-operated*' means a containing product that is not fixed to the ambient, that is intended to be carried around by people or to be frequently moved, whose position can be changed by a simple manual pick-and-place operation, and that operates only on direct current (DC) with a voltage of less than 24 V supplied from a source

contained in the same product, without being connected directly or indirectly to the mains electricity supply.

- (33) ‘*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.
- (34) ‘*Non-clear envelope*’ means a HID light source with a non-transparent outer envelope or outer tube in which the light producing arc tube is not visible.
- (35) ‘*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.
- (36) ‘*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.

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.

- (37) ‘*declared value*’ for a parameter means the value given by the manufacturer or importer in the technical documentation pursuant to Article 3(3) of Regulation 2017/1369.
- (38) ‘*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.
- (39) ‘*colour temperature*’ (Tc [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.
- (40) ‘*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).
- (41) ‘*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.

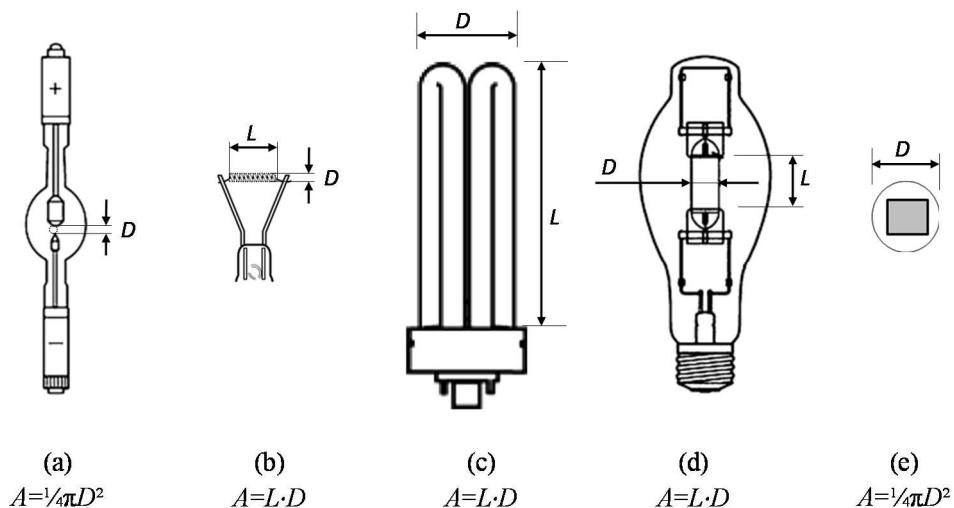
The displacement factor is measured at full-load, for the reference control settings where applicable, with any lighting control parts in control mode and non-lighting parts disconnected, switched off or set to minimum power consumption according to manufacturer’s instructions.

- (42) ‘*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.
- (43) ‘*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.

- (44) '*lifetime*' for LED and OLED light sources means the time in hours between the start of their use and the moment when 50% of a population of light sources have either abruptly failed (no light output anymore) or their light output has gradually degraded to a value below 70% of the initial luminous flux. This is also referred to as the M₇₀F₅₀ lifetime.
- (45) '*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.
- (46) '*projected light-emitting surface area*'(A), in mm², is the surface area 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 non-clear envelope or with anti-glare shield, the light-emitting surface area is the entire area through which light is leaving the light source.

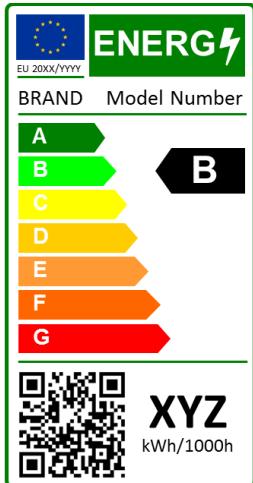
For light sources containing more than one light emitter, the smallest gross volume enveloping all emitters shall be taken as the light-emitting surface.



ANNEX III

Label for light sources

- (1) The label shall be as in the following illustration :



- (2) The following information shall be included in the label for light sources:

- I. trademark or supplier's name;
- II. model identifier), meaning the code, usually alphanumeric, which distinguishes a light source model from other models with the same trade mark or supplier's name;
- III. the energy efficiency class determined in accordance with Annex IV; the head of the arrow containing the energy efficiency class of the light source shall be placed at the same height as the head of the arrow of the relevant energy efficiency class;
- IV. a quick response code (QR-code) redirecting to a website optimized for mobile devices where additional information on the light source can be found;
- V. the energy consumption (XYZ), expressed in kWh of electricity consumption per 1000 hours of light source on-mode operation.

- (3) The label shall meet all the following requirements in its standard size. If the label is printed in a larger format, its content must nevertheless remain proportionate to the specifications for the standard size below:

(XXX)

- (4) The following label application rules shall apply:

- (a) The label shall be placed on the side of the packaging that the end-user is intended to see first in a point of sale. Only if the label would significantly

distort or complicate the packaging (such as in some blister packages) can the label be placed on another side.

- (b) If the packaging is too small to accommodate the standard size label, a standard size or larger label shall be attached or placed in close proximity to the packaging, making it clear which product the label refers to.
- (c) If the label cannot be placed on the side of the packaging that the end-user is intended to see first in a point of sale as described in point (a), or if the packaging is too small to accommodate the minimum size label as described in point (b), a coloured arrow designating the energy efficiency class shall be placed on the side of the packaging that the end-user is intended to see first in a point of sale. The arrow shall follow the relevant design specifications as described in Annex IX, and have a minimum size of 33,4mm width and 21mm height.
- (d) If a model specimen is presented in a point of sale, a standard size label shall be attached or placed in close proximity to the specimen, making it clear which product the label refers to.
- (e) Nothing else placed or printed on, or attached to, the individual packaging or the model shall obscure the label, confuse its meaning or reduce its visibility, except if the model has been awarded an ‘EU ecolabel’ under Regulation (EC) No 66/2010. In this case a copy of the EU ecolabel may be added, but the energy label shall continue to be visible.
- (f) The label, and where applicable the coloured arrow under point (c), can be printed directly on the packaging, or can be a sticker firmly attached to the packaging, or can be a separate item inside the packaging provided it is clearly visible from the outside through e.g. a transparent part of the packaging, or any other solution, as long as it is clearly visible without opening the packaging and does not obstruct other information required to be present on the packaging according to Annex V.

ANNEX IV

Energy efficiency classes and calculation method

The energy efficiency class of light sources shall be determined on the basis of the efficacy values expressed in total mains efficacy η_{TM} , which is defined as the total initial luminous flux (in lm) divided by mains power input (in W) – (lm/W) – as set out in Table 1.

Table 1

Energy efficiency class	Total mains efficacy η_{TM} (lm / W)
A	$210 \leq \eta_{TM}$
B	$185 \leq \eta_{TM} < 210$
C	$160 \leq \eta_{TM} < 185$
D	$135 \leq \eta_{TM} < 160$
E	$110 \leq \eta_{TM} < 135$
F	$85 \leq \eta_{TM} < 110$
G	$85 \leq \eta_{TM}$

The total mains efficacy η_{TM} is calculated by dividing the declared useful luminous flux Φ_{use} (expressed in lm) by the declared on-mode power consumption P_{on} (expressed in W) and multiplying by the applicable factor F_{TM} of Table 2, i.e.:

$$\eta_{TM} = (\Phi_{use} / P_{on}) * F_{TM} \text{ (} lm/W \text{).}$$

Table 2 Factors F_{TM} to be used for determination of $\eta_{TM} = (\Phi_{use} / P_{on}) * F_{TM} \text{ (} lm/W \text{)}$

Light source type	Factor F_{TM}
Non-directional mains light source (NDLS, MLS)	1.000
Non-directional non-mains light source (NDLS, NMLS)	0.926
Directional mains light source (DLS, MLS)	1.176
Directional non-mains light source (DLS, NMLS)	1.089

ANNEX V

Product information

1. PRODUCT INFORMATION SHEET

The product information sheet to be provided by the supplier pursuant to Article 3(d) shall contain all the information entered in the public part of the product database established by Regulation (EU) 2017/1369, as specified in point 4.1 of this Annex.

2. TECHNICAL DOCUMENTATION

The technical documentation to be provided by the supplier pursuant to Article 3(f) shall include at least the information entered in the compliance part of the product database established by Regulation (EU) 2017/1369, as specified in point 4.2 of this Annex.

The information in the technical documentation shall be sufficient to enable market surveillance authorities to assess the accuracy of the energy label as specified in Annex III, of the product information sheet as specified in point 1 of this Annex and of the information entered in the product database as specified in point 4 of this Annex.

3. INFORMATION TO BE DISPLAYED ON THE PACKAGING

3.1. Light source as an independent product

If a light source is placed on the market in a packaging containing information to be visibly displayed to users prior to their purchase, the following information shall be clearly and prominently displayed on the packaging in addition to the energy label of Annex III:

- (a) the useful luminous flux (Φ_{use}) in a font at least twice as large as the display of the on-mode power (P_{on}), clearly indicating if it refers to the flux in a sphere (360°), in a wide cone (120°) or in a narrow cone (90°);
- (b) the colour temperature T_c in K, rounded to the nearest 100 K, also expressed graphically or in words, or the range of colour temperatures that can be set;
- (c) the beam angle in degrees (for directional lamps), or the range of beam angles that can be set;
- (d) electrical interface details, e.g. cap- or connector-type, type of power supply (e.g. 230 V AC 50 Hz, 12 V DC);
- (e) the $M_{70}F_{50}$ lifetime for LED and OLED light sources, in hours (not longer than the declared lifetime).
- (f) the on-mode power (P_{on}), expressed in W;
- (g) the standby power (P_{sb}), 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;
- (h) the networked standby power (P_{net}) for CLS, 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;

- (i) the colour rendering index CRI in Ra, rounded to the nearest integer, or the range of CRI-values that can be set;
- (j) if $CRI < 80$ Ra, and the light source is intended for use in outdoor applications, industrial applications or other applications where lighting standards allow a $CRI < 80$, a clear indication to this effect. For HID light sources with useful luminous flux > 4000 lm this indication is not mandatory;
- (k) if the light source is designed for optimum use in non-standard conditions (such as ambient temperature $T_a \neq 25$ °C or specific thermal management is necessary), information on those conditions;
- (l) a warning if the light source cannot be dimmed or can be dimmed only with specific dimmers or with specific wired or wireless dimming methods. In the latter cases a list of compatible dimmers and/or methods shall be provided on the manufacturer's website;
- (m) if it contains mercury, a warning about it including the mercury content in mg rounded to the first decimal place;
- (n) if it is in scope of Directive 2012/19/EU or contains mercury, a warning that it should not be disposed of in the general waste stream;
- (o) in addition to the QR-code included in the energy label of Annex III, the internet address for the website(s), where full information on the light source as set out in point 2.1 of this Annex can be found.

Items (a) to (d) shall be displayed on the packaging in the direction meant to face prospective buyers; for other items this is also recommended, if space permits.

For light sources that can be set to emit light with different characteristics, the information shall be reported for the reference control settings, or a range of obtainable values shall be indicated.

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.

If the packaging is too small to accommodate all required information, following Annex III.4(b), a standard size or larger label shall be attached or placed in close proximity to the packaging, and some of the information not required to face the prospective buyer may be displayed on the same physical carrier as the label instead of on the packaging.

3.2. Light source in a containing product

If a light source is placed on the market as a part in a containing product the following information requirements shall apply:

- (a) the technical documentation for the containing product shall clearly identify the contained light source(s), including the energy efficiency class according to Annex III;
- (b) the following text shall be displayed, clearly legible, on the outside of the containing product's packaging, in any advertisement, formal price quote or tender offer disclosing energy-related or price information on the containing product and in any technical promotional material for the containing product, which describes specific technical parameters:

'This product contains a light source of energy efficiency class <X> according to <replace by final indication of this Regulation>',

where <X> shall be replaced by the energy efficiency class of the contained light source according to Annex IV.

In case the product contains more than one light source, the sentence can be in plural, or repeated per light source, as suitable.

4. INFORMATION TO BE ENTERED IN THE PRODUCT DATABASE ESTABLISHED BY REGULATION (EU) 2017/1369

4.1. Public part of the product database

If a light source is placed on the market, including when it is a part in a containing product, the following information shall be entered in the public part of the product database:

- (a) supplier's name or trade mark, address, contact details and other legal identification of the supplier;
- (b) supplier's model identifier, meaning the code, usually alphanumeric, which distinguishes a specific light source model from other models with the same trade mark or supplier's name;
- (c) the energy label according to Annex III in electronic format;
- (d) the energy efficiency class according to Annex III;
- (e) the energy consumption expressed in kWh of electricity consumption per 1000 h of light source on-mode operation;
- (f) the lighting technology used, i.e. HL, LFL T5 HE, LFL T5 HO, CFLni, other FL, HPS, MH, other HID, LED, OLED, mixed, other;
- (g) if the light source is non-directional (NDLS) or directional (DLS) in the sense of this Regulation;
- (h) if the light source is a mains light source (MLS) or a non-mains light source (NMLS) in the sense of this Regulation;
- (i) if the light source is a connected light source (CLS) in the sense of this Regulation;
- (j) if the light source is a colour-tuneable light source (CTLS) in the sense of this Regulation;
- (k) if the light source has a second envelope, a non-clear envelope and/or an anti-glare shield in the sense of this Regulation;
- (l) the date (day, month, year) of last update of the information;
- (m) the date (month, year) of first production of the light source for the EU market;
- (n) if the light source is still in production for sale on the EU-market (yes/no);
- (o) if the light source is no longer in production for sale on the EU-market, the date (month, year) when production for the EU market stopped;
- (p) the information specified in point 1.1 of this Annex;

- (q) the outer dimensions in mm, without separate control gear, lighting control parts and non-lighting parts, if any;
- (r) the mass in grams of the light source, without packaging, and without separate control gear, lighting control parts and non-lighting parts, if any and if they can be physically separated from the light source;
- (s) the spectral power distribution in the range 250 nm to 800 nm, at full-load;
- (t) the displacement factor, $\cos(\phi_1)$, (for LED and OLED mains light sources);
- (u) the chromaticity coordinates (x,y);
- (v) the colour consistency in McAdam ellipses (for LED and OLED mains light sources);
- (w) the peak luminous intensity for directional light sources (in cd);
- (x) the lumen maintenance factor for FL and HID light sources at 2 000 h, 4 000 h, 6 000 h, 8 000 h, 12 000 h, 16 000 h and 20 000 h (up to 8 000 h only for new light sources on the market where no data is yet available), indicating which operation mode of the light source was used for the test if both 50 Hz and High Frequency operation are possible;
- (y) the survival factor for FL and HID light sources at 2 000 h, 4 000 h, 6 000 h, 8 000 h, 12 000 h, 16 000 h and 20 000 h (up to 8 000 h only for new light sources on the market where no data is yet available), indicating which operation mode of the light source was used for the test if both 50 Hz and High Frequency operation are possible;
- (z) the reference control settings, and instructions how they can be implemented, where applicable;
 - (aa) instructions how to remove lighting control parts and/or non-lighting parts, if any, or how to switch them off or minimize their power consumption during light source testing;
 - (bb) if it is dimmable, a list of dimmers it is compatible with, and the light source – dimmer compatibility standard(s) it is compliant with, if any;
 - (cc) if it contains mercury, instructions on how to clean up the lamp debris in case of accidental breakage;
 - (dd) recommendations on how to dispose of it at the end of its life for recycling in line with Directive 2012/19/EU.

For light sources that can be tuned to emit light at full-load with different characteristics, the values of parameters (including those of point 1.1 of this Annex) that vary with these characteristics shall at least be reported at the reference control settings.

The information does not need to use the exact wording on the list above. In addition, it may also be displayed in the form of graphs, drawings or symbols.

4.2. Compliance part of the product database

If a light source is placed on the market, including when it is a part in a containing product, the following information shall be entered in the compliance part of the product database:

- (a) the name and address of the supplier;

- (b) supplier's model identifier, meaning the code, usually alphanumeric, which distinguishes a specific light source model from other models with the same trade mark or supplier's name;
- (c) the model identifier of all equivalent models already placed on the market;
- (d) the measured technical parameters of the model, including the declared values for:
 - (1) useful luminous flux (Φ_{use}) in lm;
 - (a) colour rendering index (CRI) in Ra;
 - (b) on-mode power (P_{on}) in W;
 - (c) beam angle in degrees, for directional light sources (DLS);
 - (d) colour temperature (Tc) in K, for FL and HID light sources;
 - (e) standby power (P_{sb}) in W, including when it is zero;
 - (f) networked standby power (P_{net}) in W, for connected light sources (CLS);
 - (g) displacement factor (DF, $\cos(\phi_1)$), for LED and OLED mains light sources;
 - (h) colour consistency in MacAdam ellipse steps, for LED and OLED light sources;
 - (i) flicker metric P_{stLM} , for LED and OLED light sources;
 - (j) other measurable parameters from the public part of the product database.
- (e) the calculations performed with the measured parameters, including the determination of the energy efficiency class according to Annex IV;
- (f) references to the harmonised standards applied or other measurements standards used;
- (g) testing conditions if not described sufficiently in point (d);
- (h) the reference control settings, and instructions how they can be implemented, where applicable;
- (i) instructions how to remove lighting control parts and/or non-lighting parts, if any, or how to switch them off or minimize their power consumption during light source testing;
- (j) specific precautions that shall be taken when the model is assembled, installed, maintained or tested.

5. INFORMATION FOR PRODUCTS SPECIFIED IN ANNEX I POINT 3

For the light sources specified in Annex I point 3, the intended purpose shall be stated on all forms of packaging, product information and advertisement, together with a clear indication that the light source is not intended for use in other applications.

The technical documentation file drawn up for the purposes of conformity assessment in accordance with Article 3.3 of Regulation 2017/1369 shall list the technical parameters that make the product design specific to qualify for the exemption.

ANNEX VI

Information to be provided in the case of distance selling, except distance selling on the Internet

Any paper based distance selling must show the energy class and the range of available efficiency classes as following the example below, with the colour of the arrow matching the letter of the energy class:



It must be possible for the customer to access the full label and the product information sheet through a free access website, or to request a printed copy.

Telemarketing based distance selling must specifically inform the customer of the energy class of the product and the range of energy classes available on the label, and that they can access the full label and the product information sheet through a free access website, or by requesting a printed copy.

ANNEX VII

Information to be provided in the case of distance selling through the Internet

1. For the purpose of points 2 to 5 of this Annex the following definitions shall apply:
 - (a) ‘display mechanism’ means any screen, including tactile screen and visual technology used for displaying internet content to end-users;
 - (b) ‘nested display’ means visual interface where an image or data set is accessed by mouse click, mouse roll-over or tactile screen expansion of another image or data set;
 - (c) ‘tactile screen’ means a screen responding to touch, such as that of a tablet computer, slate computer or a smartphone;
 - (d) ‘alternative text’ means text provided as an alternative to a graphic allowing information to be presented in non-graphical form where display devices cannot render the graphic or as an aid to accessibility such as input to voice synthesis applications.
2. The appropriate label made available by suppliers in accordance with Article 3(1)(c) shall be shown on the display mechanism in proximity to the price of the product. The size shall be such that the label is clearly visible and legible and shall be proportionate to the size specified in Annex III. The label may be displayed using a nested display, in which case the image used for accessing the label shall comply with the specifications laid down in point 3 of this Annex. If nested display is applied, the label shall appear on the first mouse click, mouse roll-over or tactile screen expansion on the image.
3. The image used for accessing the label in the case of nested display shall:
 - (a) be an arrow in the colour corresponding to the energy efficiency class of the product on the label;
 - (b) indicate on the arrow energy efficiency class of the product in white in a font size equivalent to that of the price; and
 - (c) have the following format (specular image with the arrow pointing to the right is also possible):



4. In the case of nested display, the sequence of display of the label shall be as follows:
 - (a) the image referred to in point 3 of this Annex shall be shown on the display mechanism in proximity to the price of the product;
 - (b) the image shall link to the label;
 - (c) the label shall be displayed after a mouse click, mouse roll-over or tactile screen expansion on the image;
 - (d) the label shall be displayed by pop up, new tab, new page or inset screen display;
 - (e) for magnification of the label on tactile screens, the device conventions for tactile magnification shall apply;
 - (f) the label shall cease to be displayed by means of a close option or other standard closing mechanism;
 - (g) the alternative text for the graphic, to be displayed on failure to display the label, shall be the energy efficiency class of the product in a font size equivalent to that of the price.

The appropriate product information sheet made available by suppliers in accordance with Article 3(1)(d) shall be shown on the display mechanism in proximity to the price of the product. The size shall be such that the product information sheet is clearly visible and legible. The product information sheet may be displayed using a nested display, in which case the link used for accessing the product information sheet shall clearly and legibly indicate ‘Product information sheet’. If nested display is used, the product information sheet shall appear on the first mouse click, mouse roll-over or tactile screen expansion on the link.

ANNEX VIII

Verification procedure for market surveillance purposes

The verification tolerances set out in this Annex relate only to the verification of the declared parameters by Member State authorities and shall not be used by the supplier as an allowed tolerance to establish the values in the technical documentation. The values and classes on the label or in the product information sheet shall not be more favourable for the supplier than the declared values reported in the technical documentation.

When verifying the compliance of a product model with the requirements laid down in this Delegated Regulation, for the requirements referred to in this Annex, the authorities of the Member States shall apply the following procedure:

- (1) The Member State authorities shall verify one single unit of the model.
- (2) The model shall be considered to comply with the applicable requirements if:
 - (a) the values given in the technical documentation pursuant to Article 3.3 of Regulation (EU) 2017/1369 (declared values), and, where applicable, the values used to calculate these values, are not more favourable for the supplier than the corresponding values given in the test reports; and
 - (b) the values published on the label and in the product information sheet are not more favourable for the supplier than the declared values, and the indicated energy efficiency class is not more favourable for the supplier than the class determined by the declared values,
- (3) If the results referred to in point 2(a) or (b) are not achieved, the model and all equivalent models shall be considered not to comply with this Regulation.
- (4) If the results referred to in point 2(a) and (b) are achieved, the Member States authorities shall test 10 units of the model. If the acquisition costs for the 10 units exceed 500 euros, Member State authorities will have the option to reduce the sample size to 3 units.
- (5) The model and all equivalent models shall be considered to comply with the applicable requirements if the determined values of the applicable parameters comply with the respective verification tolerances as given in Table 4. The determined values are assessed as follows:
 - (a) for each unit measure the applicable parameters from Table 4;
 - (b) calculate the determined value of each applicable parameter as the arithmetical mean of the measured values of the 10 (or 3) units for that parameter.
- (6) If the results referred to in point 5 are not achieved, the model and all equivalent models shall be considered not to comply with this Regulation.
- (7) 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 6.

The Member State authorities shall use reliable, accurate and reproducible measurement procedures, which take into account the generally recognised state-of-the-art measurement methods, including methods set out in documents whose reference numbers have been published for that purpose in the *Official Journal of the European Union*.

The Member State authorities shall only apply the verification tolerances that are set out in Table 4 and shall only use the procedure described in points 1 to 7 for the requirements referred to in this Annex. No other tolerances, such as those set out in harmonised standards or in any other measurement method, shall be applied.

In case light sources are placed on the market as parts inside a containing product or supplied with the product, the supplier of this containing product shall facilitate market surveillance authorities verifying compliance of the light sources with this Regulation by providing, on request, detailed instructions to the market surveillance authorities how to dismount light source(s) for inspection without permanent mechanical damage.

If the containing product contains multiple identical light sources, possibly each individually emitting less than 60 lm but in total emitting more than 60 lm, verification testing of the market surveillance authorities may be limited to a representative subset of the individual light sources and the results can be extrapolated.

Table 4: Verification tolerances

Parameter	Sample size	Verification tolerances
Full-load on-mode power P_{on} [W]:		
$P_{on} \leq 5W$	3	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 %.
$5W < P_{on} < 100W$	3	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 5 %.
$P_{on} \geq 100W$	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 %.
Power factor [0-1]		
	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 %.
Useful luminous flux Φ_{use} [lm]		
	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 %.
No-load power P_{no}, Standby power P_{sb} and Networked standby power P_{net} [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 deviate from the declared value by more than 3.
	10	The determined value shall not deviate from the declared value by more than 2.

Flicker [Pst LM]	3	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 5 %.
Colour Consistency [MacAdam ellipse 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.
Control gear efficiency [%]		
$P_{out} \leq 5W$	10	The determined value shall not be less than 90% of the declared value.
$5W < P_{out} < 100W$	10	The determined value shall not be less than 95% of the declared value.
$P_{out} \geq 100W$	10	The determined value shall not be less than 97,5% of the declared value.
Luminous intensity [cd]	3	The determined value shall not deviate from the declared value by more than 10 %.
	10	The determined value shall not deviate from the declared value by more than 5 %.
Beam angle (degrees)	3	The determined value shall not deviate from the declared value by more than 10 %.
	10	The determined value shall not deviate from the declared value by more than 5 %.
Lumen Maintenance Factor (for FL and HID)	3	The determined value shall not be less than 90% of the declared value.
	10	The determined value shall not be less than 95% of the declared value.
Survival Factor (for FL and HID)	3	The determined value shall not be less than 0.65 (1 of 3 allowed to fail)
	10	The determined value shall not be less than 0.90 (1 of 10 allowed to fail).
M₇₀F₅₀ 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%

ANNEX IX

Displaying the energy class and the range of efficiency classes in visual advertisements and in promotional material

1. For the purposes of ensuring conformity with the requirements laid down in Article 3(1)(g) and Article 4(1)(c), the energy class and the range of efficiency classes available on the label shall be shown on visual advertisements as follows, with the colour of the arrow matching the letter of the energy class:



2. For the purposes of ensuring conformity with the requirements laid down in Article 3(1)(h) and Article 4(1)(d) the energy class and the range of efficiency classes available on the label shall be shown in promotional material as follows, with the colour of the arrow matching the letter of the energy class:

