



Brussels, **XXX**
[...](2018) **XXX** draft

ANNEXES 1 to 9

ANNEXES

to the

Commission Delegated Regulation

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

and repealing Commission Delegated Regulation (EU) No 874/2012

ANNEX I

Definitions applicable for the Annexes

The following definitions shall apply for the purposes of the Annexes:

- (1) 'mains light source (MLS)' means a light source that can be operated directly on the mains electricity supply. Light sources that operate directly on the mains, and can also operate indirectly on the mains using a separate control gear, shall be considered to be mains light sources;
- (2) 'non-mains light source (NMLS)', means a light source that is not a mains light source. These light sources require a separate control gear to operate on the mains;
- (3) '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 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'. The light source can have physically integrated data-connection parts in a single inseparable housing, or the light source can be combined with physically separate data-connection parts placed on the market together with the light source as a single product;
- (7) 'data-connection parts' means parts that perform any one of the following functions:
 - (a) reception or transmission of wired or wireless data signals and the processing thereof (used to control the light emission function and possibly otherwise);
 - (b) sensing and processing of the sensed signals (used to control the light emission function and possibly otherwise);
 - (c) actuation by audio control (including voice control);
 - (d) a combination of these;
- (8) 'colour-tuneable light source' (CTLS) means a light source that can be set to emit light with a large variation of colours outside the range defined in Article 2 but can also be set to emit white light inside the range defined in Article 2 for which the light source is within the scope of this Regulation.

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

The term also does not include dim-to-warm light sources, that shift their white light output to lower correlated colour temperature when dimmed, simulating the behaviour of incandescent light sources;
- (9) 'colour purity index' means a percentage computed for a CTLS set to emit light of a certain colour, using a procedure further defined in standards, by drawing a straight line on an (x and y) colour space graph from a point with colour coordinates $x=0.313$ and $y=0.330$ (D65 reference point, point 1), going through the point representing the

(x and y) colour coordinates of the light source (point 2), and ending on the outer border of the colour space (locus; point 3). The colour purity index is computed as the distance between points 1 and 2 divided by the distance between points 1 and 3. The full length of the line represents 100% colour purity (point on the locus). The D65 reference point represents 0 % colour purity (white light);

- (10) ‘lighting control parts’ means parts that are integrated in a light source, or 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, correlated colour temperature, light spectrum and/or beam angle. Dimmers shall also be considered as lighting control parts.

The term also includes data-connection parts, but the term does not include devices within the scope of Commission Regulation (EC) No 1275/2008¹;

- (11) ‘non-lighting 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 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);

- (12) ‘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°);

- (13) ‘beam angle’ of a directional light source means the angle between two imaginary lines in a plane through the optical beam axis, such that these lines pass through the centre of the front face of the light source and through points at which the luminous intensity is 50 % of the centre beam intensity, where the centre beam intensity is the value of luminous intensity measured on the optical beam axis.

For light sources that have different beam angles in different planes, the largest beam angle shall be the one taken into account;

For light sources with user-controllable beam angle, the beam angle corresponding to the ‘reference control setting’ shall be the one taken into account;

- (14) ‘full-load’ means the condition of a light source, within the declared operating conditions, in which it emits the maximum (undimmed) initial luminous flux;

- (15) ‘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

¹ OJ L 339, 18.12.2008, p. 45.

source is awaiting a control signal (from a source different from a network) to return to a state with light emission. Lighting control parts enabling the standby function shall be in their control mode. Non-lighting parts shall be disconnected or switched off or their power consumption shall be minimised following manufacturer's instructions;

- (16) '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. Non-lighting parts shall be disconnected or switched off or their power consumption shall be minimised following manufacturer's instructions;
- (17) '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 control signal can be internally generated or a remotely initiated trigger can be received, by wire or wireless, and processed to lead to a change in the light emission of the light source;
- (18) 'remotely initiated trigger' means a signal that comes from outside the light source via a network;
- (19) 'control signal' means an analogue or digital signal transmitted to the light source wirelessly or wired either via voltage modulation in separate control cables or via a modulated signal in the supply voltage. The signal transmission is not through a network but e.g. from an internal source or from a remote control delivered with the product;
- (20) 'network' means a communication infrastructure with a topology of links, an architecture, including the physical components, organisational principles, communication procedures and formats (protocols);
- (21) 'on-mode power' (P_{on}), expressed in Watt, means the electric power consumption of a light source in full-load with all lighting control parts and non-lighting parts disconnected. If these parts cannot be disconnected, they shall be switched off or their power consumption shall be minimised following the manufacturer's instructions. 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;
- (22) 'standby power' (P_{sb}), expressed in Watt, is the electric power consumption of a light source in standby mode;
- (23) 'networked standby power' (P_{net}), expressed in Watt, is the electric power consumption of a connected light source (CLS) in networked standby mode;
- (24) 'reference control settings' (RCS) means a control setting or a combination of control settings that is used to verify compliance of a light source with this Regulation. These settings are relevant for light sources that allow the end-user to control, manually or automatically, directly or remotely, the luminous intensity, colour, correlated colour temperature, spectrum, and/or beam angle of the emitted light.

In principle, the reference control settings shall be those predefined by the manufacturer as factory default values, and encountered by the user at first installation (out-of-the-box values). If the installation procedure provides for an automatic software update during first installation, or if the user has the option to perform such an update, the resulting change in settings (if any) shall be taken into account.

If the out-of-the-box value is deliberately set differently from the reference control setting (e.g. at low power for safety purposes), the manufacturer shall indicate in the technical documentation how to recall the reference control settings for compliance verification.

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

- the light source is within the scope of this Regulation according to Article 1 and none of the conditions for exemption applies;
- lighting control parts and non-lighting parts are disconnected or switched-off, or, in case this is not possible, the power consumption of these parts is minimal;
- the full-load condition is obtained;
- when the end-user opts to reset factory defaults, the reference control settings are obtained.

For light sources that allow the manufacturer of a containing product to make implementation choices that influence light source characteristics (e.g. definition of the operating current(s); thermal design), and that cannot be controlled by the end-user, the reference control settings need not be defined. In that case the nominal test conditions as defined by the light source manufacturer apply;

- (25) ‘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 vaporised mercury operating at a partial pressure in excess of 100 kilopascals;
- (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 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;

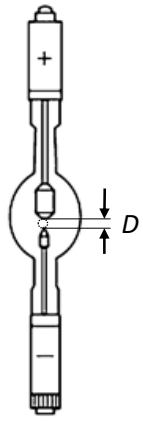
- (30) ‘LFL T5-HO’ means a high-output linear fluorescent T5 light source with driving current higher than or equal to 0,2 A;
- (31) ‘HL R7s’ means a mains-voltage, double-capped, linear halogen light source with a cap diameter of 7 mm;
- (32) ‘battery-operated’ means a product that operates only on direct current (DC) supplied from a source contained in the same product, without being connected directly or indirectly to the mains electricity supply;
- (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’ for a HID light source means 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 parameter ‘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) ‘stroboscopic effect’ means a change in motion perception induced by a light stimulus the luminance or spectral distribution of which fluctuates with time, for a static observer in a non-static environment. The fluctuations can be periodic and non-periodic and may be induced by the light source itself, the power source or other influencing factors.
- The metric for the stroboscopic effect used in this Regulation is the ‘SVM’ (stroboscopic visibility measure), as defined in standards. SVM = 1 represents the visibility threshold for an average observer;
- (38) ‘R9’ means the colour rendering index for a red coloured object as defined in standards;
- (39) ‘declared value’ for a parameter means the value given by the supplier in the technical documentation pursuant to Article 3(3) of Regulation (EU) 2017/1369;
- (40) ‘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;
- (41) ‘correlated colour temperature’ (CCT [K]) means the temperature of a Planckian (black body) radiator whose perceived colour most closely resembles that of a given stimulus at the same brightness and under specified viewing conditions;

- (42) ‘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);
- (43) ‘displacement factor (cos ϕ_1)’ means the cosine of the phase angle ϕ_1 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 the manufacturer’s instructions;
- (44) ‘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;
- (45) ‘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;
- (46) ‘lifetime’ for LED and OLED light sources means the time in hours between the start of their use and the moment when for 50 % of a population of light sources the light output has gradually degraded to a value below 70 % of the initial luminous flux. This is also referred to as the $L_{70}B_{50}$ lifetime;
- (47) ‘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;
- (48) ‘projected light-emitting surface area (A)’ is the surface area in mm^2 (square millimetres) of the view in an orthographic projection of the light-emitting surface from the direction with the highest light intensity, where the light-emitting surface area is the surface area of the light source that emits light with the declared optical characteristics, such as the approximately spherical surface of an arc (a), cylindrical surface of a filament coil (b) or a gas discharge lamp (c, d), flat or semi-spherical envelope of a light-emitting diode (e).

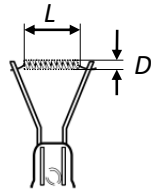
For light sources with a non-clear envelope or with anti-glare shield, the light-emitting surface area is the entire area through which light leaves the light source.

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

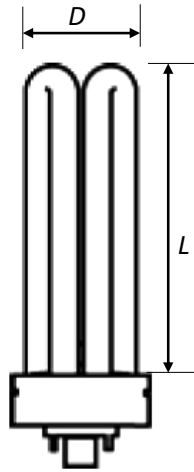
For HID light sources definition (a) applies, unless the dimensions defined in (d) apply with $L > D$, where L is the distance between the electrode tips and D the inner diameter of the arc tube.



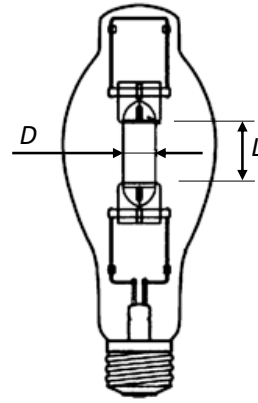
(a)
 $A = \frac{1}{4}\pi D^2$



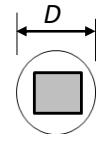
(b)
 $A = L \cdot D$



(c)
 $A = L \cdot D$



(d)
 $A = L \cdot D$



(e)
 $A = \frac{1}{4}\pi D^2$

ANNEX II

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 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 classes of light sources

Energy efficiency class	Total mains efficacy η_{TM} (<i>lm/W</i>)
A (most efficient)	$210 \leq \eta_{TM}$
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 (least efficient)	$\eta_{TM} < 85$

The total mains efficacy 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.:

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

Table 2: Factors F_{TM} by light source type

Light source type	Factor F_{TM}
Non-directional (NDLS) operating on mains (MLS)	1,000
Non-directional (NDLS) not operating on mains (NMLS)	0,926
Directional (DLS) operating on mains (MLS)	1,176
Directional (DLS) not operating on mains (NMLS)	1,089

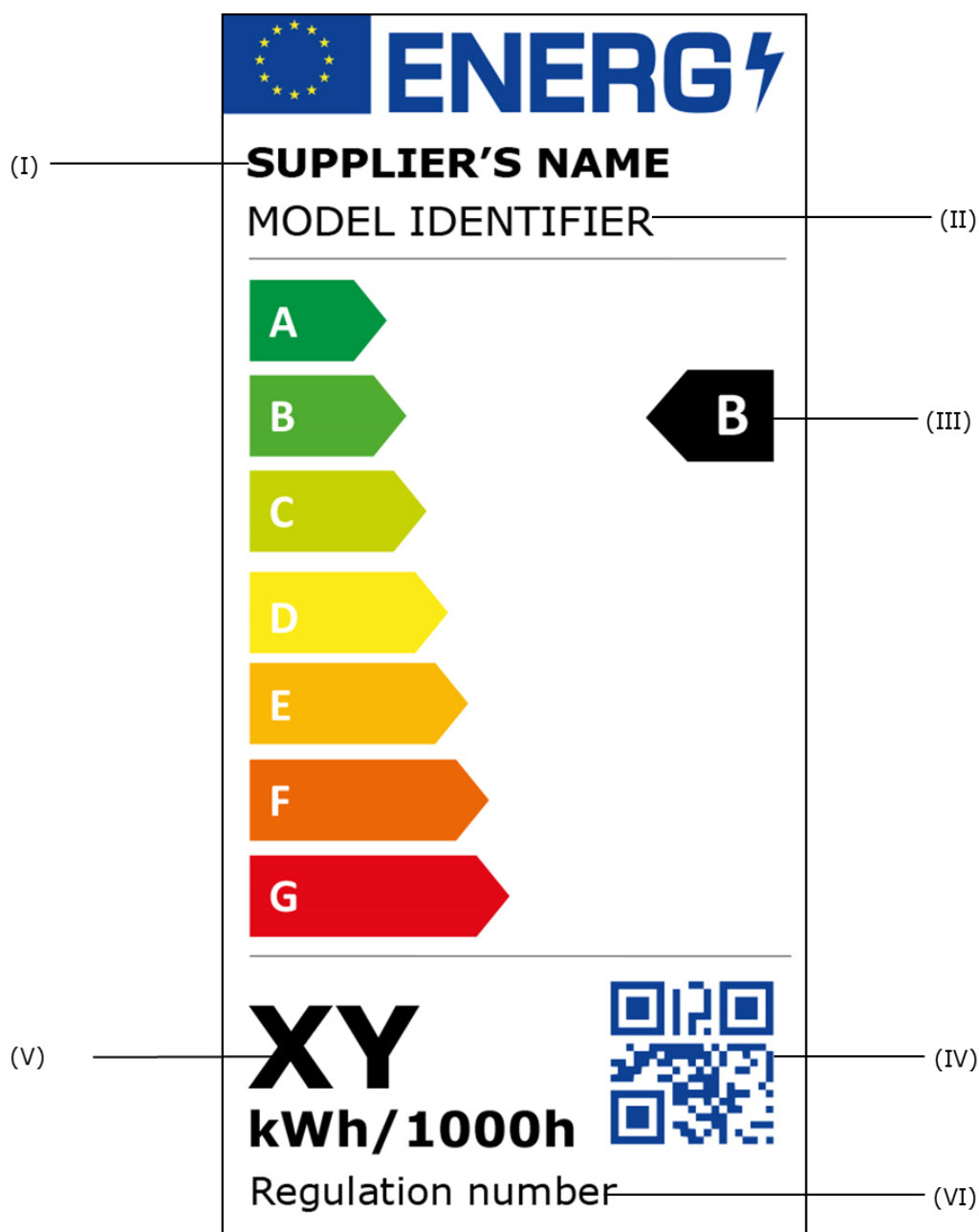
ANNEX III
Label for light sources

1. LABEL

If the light source is intended to be marketed through a point of sale, a label produced in the format and containing information as set out in this Annex is placed or printed on, or attached to, the outside of the individual packaging.

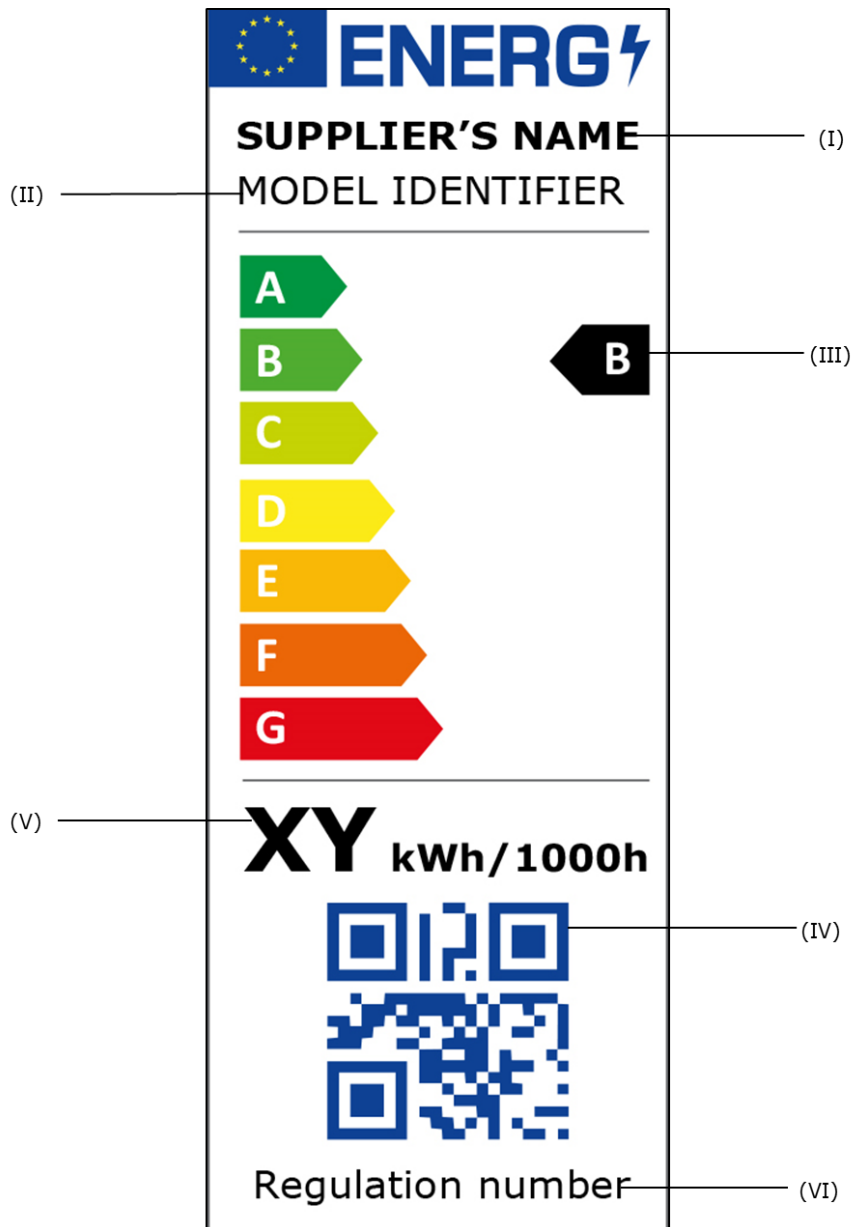
Suppliers shall choose a label format between point 1.1 and point 1.2 of this Annex.

1.1. Standard label:

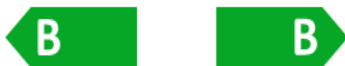


1.2. Label for small packaging:

For a part of the packaging which is not meant to face the prospective buyer, the label shall be:



For the part of the packaging meant to face the prospective buyer, the arrow containing the letter of the energy efficiency shall be displayed in one of the two following formats:



The colour of the arrow shall match the colour of the energy class.

1.3. The following information shall be included in the label for light sources:

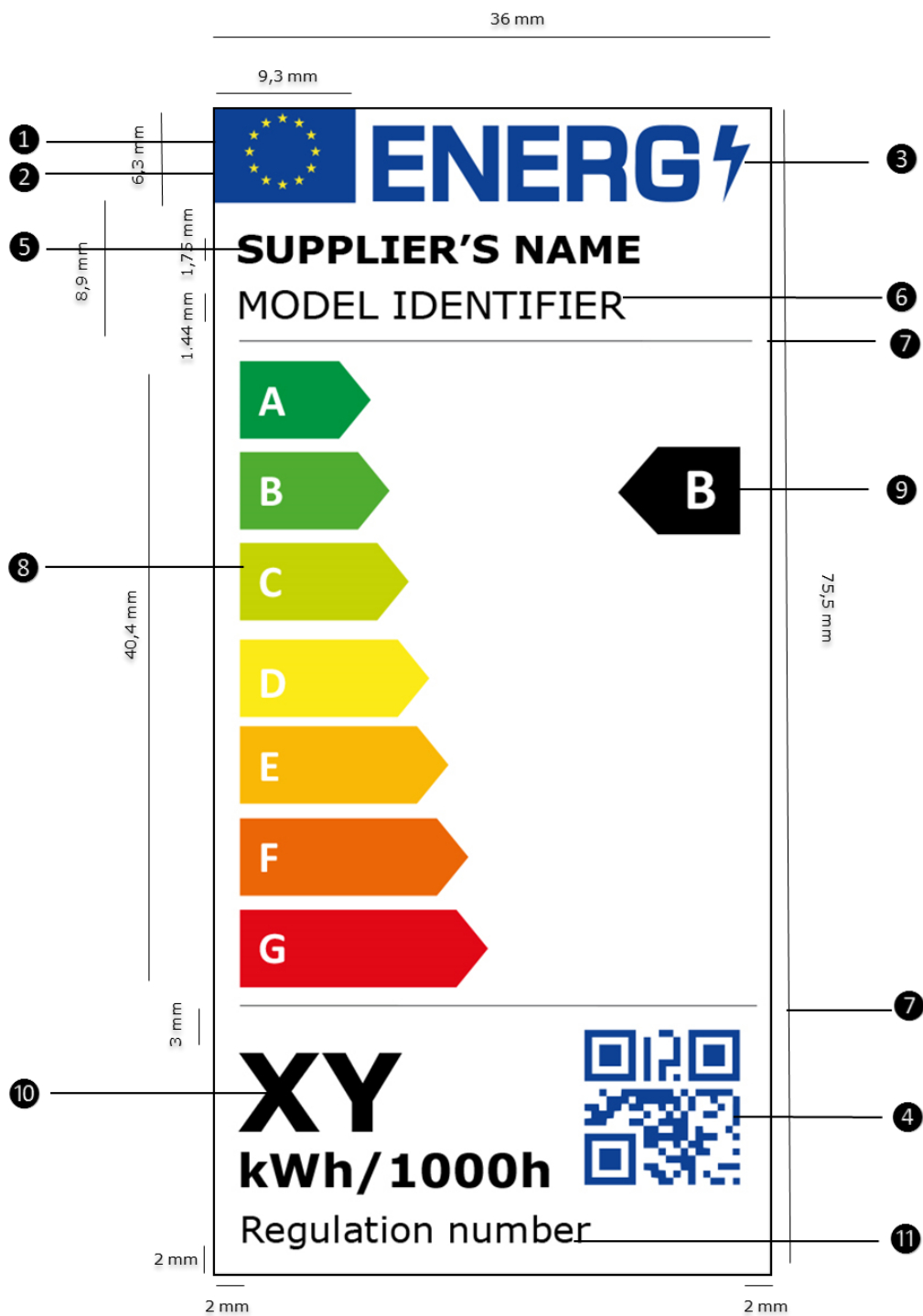
- I supplier's name or trade mark;
- II supplier's model identifier;
- III the energy efficiency class; the head of the arrow containing the energy efficiency class shall be placed at the same height as the head of the arrow of the relevant energy efficiency class;
- IV the QR-code, linking to the model information available in the public part of the product database;

V the energy consumption, expressed in kWh of electricity consumption per 1000 hours of light source in on-mode operation;

VI the number of this Regulation, that is *[OP- please insert the number of this Regulation]*.

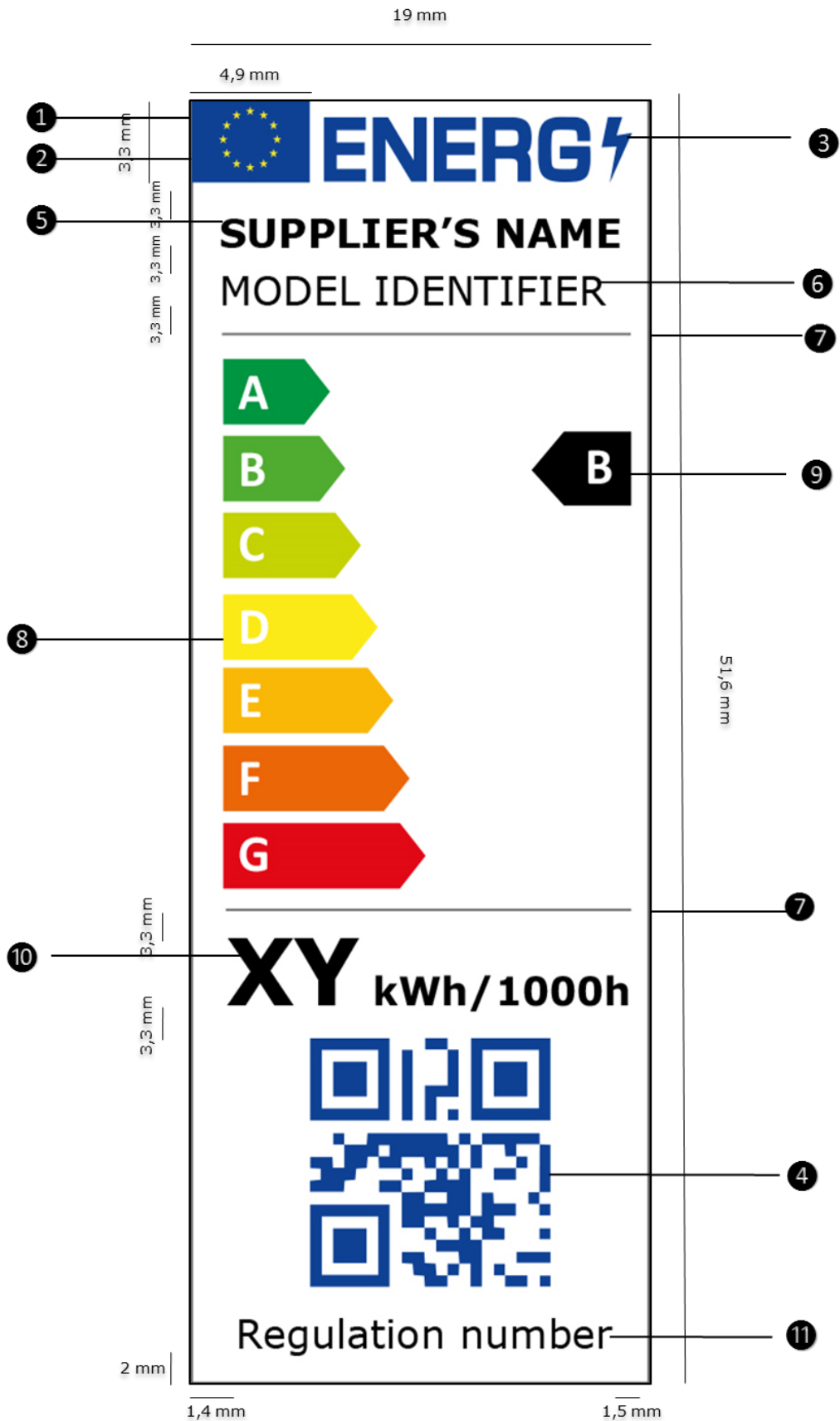
2. LABEL DESIGN

2.1. Standard label:



2.2. Label for small packaging:

For small packaging, the label can be in the following format, for a part of the packaging which is not meant to face the prospective buyer:



2.3. Description:

Whereby:


- (a) The background of the label shall be white.
- (b) The single typeface shall be Verdana.
- (c) Colours shall be CMYK – cyan, magenta, yellow and black, following this example: 0-70-100-0: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.
- (d) The label shall fulfil all the following requirements (numbers refer to the numbers in the black bullets in the figures above):
 - (1) the border of the label shall have weight of 1 pt;
 - (2) the colour of the background of the EU logo shall be 1,80,0,0 and the colour of the stars shall be 0,0,100,0;
 - (3) the colour of the energy logo shall be 100,80,0,0;
 - (4) the colour of the QR code shall be 100,80,0,0 and the minimum size 10 x 10 mm;
 - (5) the supplier’s name shall be in colour black in font bold, 9 pt;
 - (6) the model identifier shall be in colour black in font regular, 9 pt;
 - (7) the dividers shall be 86 mm wide and have a weight of 1 pt. The colour of the divider shall be 39,4,0,62;
 - (8) the A to G scale shall be as follows:
 - the colour of the energy rating scale shall be in colour white, and font bold, 19 pt;
 - the dimensions and colours of the energy rating scale for the standard label shall be as follows:



Colours (CMYK)
A-class: 100,0,100,0
B-class: 70,0,100,0
C-class: 30,0,100,0
D-class: 0,0,100,0
E-class: 0,30,100,0
F-class: 0,70,100,0
G-class: 0,100,100,0

- (9) the energy efficiency class shall be as follows:

- the colour of the letter shall be white and the font shall be in bold, 33 pt and positioned in such a way that the edges of the rating scale arrow and the energy efficiency class arrow are aligned;
- the dimensions and colour shall be as follows:

Rating scale and class	Colours (CMYK)
 <p style="text-align: center;">7,9mm</p> <p style="text-align: right;">5,6mm</p>	<p>The arrow: 0-0-0-100</p>

- (10) the annual energy consumption and kWh shall be in font bold, 26 pt, "annum" shall be in font bold, 16 pt; and the text shall be centred.

ANNEX IV
Exemptions

1. This Regulation shall not apply to light sources specifically tested and approved to operate:
- (a) in radiological and nuclear medicine installations, as defined in Article 3 of Directive 2009/71/EURATOM²;
 - (b) in or on military or civil defence establishments, equipment, ground vehicles, marine equipment or aircraft as set out in Member States' regulations or in documents issued by the European Defence Agency;
 - (c) in or on motor vehicles, their trailers and systems, interchangeable towed equipment, components and separate technical units, as set out in Regulation (EC) No 661/2009 of the European Parliament and of the Council³, Regulation (EU) No 167/2013 of the European Parliament and of the Council⁴ and Regulation (EU) No 168/2013 of the European Parliament and of the Council⁵;
 - (d) in or on non-road mobile machinery as set out in Regulation (EU) 2016/1628 of the European Parliament and of the Council⁶;
 - (e) in or on civil aviation aircrafts as set out in Commission Regulation (EU) No 748/2012⁷;
 - (f) in railway vehicle lighting as set out in Directive 2008/57/EC of the European Parliament and of the Council⁸;
 - (g) in marine equipment as set out in Directive 2014/90/EU of the European Parliament and of the Council⁹;
 - (h) in medical devices as set out in Council Directive 93/42/EEC¹⁰ and in vitro medical devices as set out in Directive 98/79/EC of the European Parliament and of the Council¹¹.

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 measures, or relevant European or international standards or, in the absence of these, according to relevant Member States legislation; 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

² OJ L 172, 2.7.2009, p. 18
³ OJ L 200, 31.7.2009, p.1-24
⁴ OJ L60, 2.3.2013, p. 1–51
⁵ OJ L60, 2.3.2013, p. 52
⁶ OJ L252, 16.9.2016, p. 53–117
⁷ OJ L 224, 21.8.2012, p. 1-85
⁸ OJ L 191, 18.7.2008, p. 1–45
⁹ OJ L 257, 28.8.2014, p. 146–185
¹⁰ OJ L 169, 12.7.1993, p. 1
¹¹ OJ L331, 7.12.1998, p.1

- is placed on the market specifically for the mentioned operating condition or application, as evidenced at least by the technical documentation, information on the packaging and any advertising or marketing materials.

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

- (a) electronic displays (e.g. televisions, computer monitors, notebooks, tablets, mobile phones, e-readers, game consoles), including but not limited to displays within the scope of Commission Regulation (EU) *[OP- please insert here the references of the regulation on ecodesign requirements for electronic displays and TV review]* Commission Regulation (EU) No 617/2013¹², Commission Decision (EU) 2015/1402¹³, Commission Regulation (EC) No 642/2009¹⁴, Commission Decision (EU) 2016/1756¹⁵, Commission Communication COM(2015)178¹⁶;
- (b) light sources in range hoods within the scope of Commission Delegated Regulation (EU) No 65/2014;
- (c) light sources in battery-operated products, including but not limited to e.g. torches, mobile phones with an integrated torch light, toys including light sources, desk lamps operating only on batteries, armband lamps for cyclists, solar-powered garden lamps;
- (d) light sources on bicycles and other non-motorised vehicles;
- (e) light sources that do not comply with requirements becoming applicable with Commission Regulation (EU) *[OP – please insert here the number of the accompanying ecodesign regulation for light sources and separate control gears (review)]* implementing Directive 2009/125/EC of the European Parliament and of the Council.

3. Any light source within the scope of this Delegated Regulation shall be exempt from the requirements of this Regulation, with the exception of the requirements set out in Annex V, point 3, if it is specifically designed and marketed 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, photocopying, printing (directly or in pre-processing), lithography, film and video projection, holography);
- (c) light sources with specific effective ultraviolet power >2 mW/klm and intended for use in applications requiring high UV-content;
- (d) light sources with a peak radiation around 253,7 nm and intended for germicidal use (destruction of DNA);
- (e) light sources emitting 5 % or more of total radiation power of the range 250-800 nm in the range of 250-315 nm and/or 20 % or more of total radiation

¹² OJ L 175, 27.6.2013, p.13 (computers)

¹³ OJ L 217, 18.8.2015, p.9 (office equipment, computers)

¹⁴ OJ L 191, 23.7.2009, p.42 (televisions)

¹⁵ OJ L 268, 1.10.2016, p.90 (office equipment, displays)

¹⁶ COM(2015) 178 final, 22.4.2015 (related to self-regulatory initiative regarding game consoles)

power of the range 250-800 nm in the range of 315-400 nm, and intended for disinfection or fly trapping;

- (f) light sources having the primary purpose to emit radiation around 185,1 nm and intended to be used for the generation of ozone;
- (g) light sources emitting 40 % or more of total radiation power of the range 250-800 nm in the range of 400-480 nm, and intended for coral zooxanthellae symbioses;
- (h) FL light sources emitting 80 % or more of total radiation power of the range 250-800 nm in the range of 250-400 nm, and intended for sun-tanning;
- (i) HID light sources emitting 40 % or more of total radiation power of the range 250-800 nm in the range of 250-400 nm, and intended for sun-tanning;
- (j) light sources with a photosynthetic efficacy $>1.2 \mu\text{mol/J}$, and/or emitting 25 % or more of total radiation power of the range 250-800 nm in the range of 700-800 nm, and intended for use in horticulture.

4. Light sources in refrigerating appliances within the scope of Commission Delegated Regulation (EU) *[OP- please insert the number of the regulation on energy labelling for refrigerating appliances (review)]* shall be only subject to the requirements for light sources laid down in that Regulation when the light sources are not placed on the Union market before they are integrated into the refrigerating appliance.

ANNEX V
Product information

1. Product information sheet

- 1.1. The information in the product information sheet of a light source referred to in Article 3.1(b), including when the light source is a part in a containing product, shall be provided in the following order and shall be included in the product brochure or other literature provided with the product:
- (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 II;
 - (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 (month, year) when the light source was first produced for the EU market;
 - (m) the information specified in point 2.1 of this Annex;
 - (n) the outer dimensions in mm, without separate control gear, lighting control parts and non-lighting parts, if any;
 - (o) the spectral power distribution in the range 250 nm to 800 nm, at full-load;
 - (p) the displacement factor ($\cos \phi_1$) for LED and OLED mains light sources;
 - (q) the chromaticity coordinates (x and y);
 - (r) the colour consistency in McAdam ellipses for LED and OLED mains light sources;
 - (s) the R9 colour rendering index value for LED and OLED light sources;
 - (t) the peak luminous intensity for directional light sources (in cd);

- (u) 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;
- (v) 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;
- (w) the lumen maintenance factor for LED and OLED light sources;
- (x) the survival factor for LED and OLED light sources;
- (y) the reference control settings, and instructions on how they can be implemented, where applicable;
- (z) instructions on how to remove lighting control parts and/or non-lighting parts, if any, or how to switch them off or minimize their power consumption;
- (aa) if the light source is dimmable: a list of dimmers it is compatible with, and the light source – dimmer compatibility standard(s) it is compliant with, if any;
- (bb) if the light source contains mercury: instructions on how to clean up the debris in case of accidental breakage;
- (cc) recommendations on how to dispose of the light source at the end of its life in line with Directive 2012/19/EU of the European Parliament and of the Council.

For light sources that can be tuned to emit light at full-load with different characteristics, the values of parameters that vary with these characteristics shall at least be reported at the reference control settings.

If the light source is no longer supplied for sale on the EU market, the supplier shall put in the product database the date (month, year) when the supply for the EU market stopped.

- 1.2. One product information sheet may cover a number of light sources supplied by the same supplier.

2. Information to be displayed on the packaging

2.1. Light source

If a light source is placed on the market, not in a containing product, in a packaging containing information to be visibly displayed at a point-of-sale prior to its 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 correlated colour temperature, rounded to the nearest 100 K, also expressed graphically or in words, or the range of correlated colour temperatures that can be set;

- (c) the beam angle in degrees (for directional light sources), 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 L_{70B50} lifetime for LED and OLED light sources, expressed in hours;
- (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;
- (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;
- (i) the colour rendering index, rounded to the nearest integer, or the range of CRI-values that can be set;
- (j) if $CRI < 80$, 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 could be provided on the manufacturer's website;
- (m) if the light source contains mercury: a warning about it including the mercury content in mg rounded to the first decimal place;
- (n) if the light source is within the scope of Directive 2012/19/EU, without prejudice to marking obligations pursuant to Article 14(4) of Directive 2012/19/EU, or contains mercury: a warning that it shall not be disposed of as unsorted municipal waste;
- (o) in addition to the QR-code included in the energy label, the internet address for the supplier's website(s) could be provided.

Items (a) to (d) shall be displayed on the packaging in the direction meant to face prospective buyer; 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. In addition, a range of obtainable values may be indicated.

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

If the packaging is too small to accommodate all required information, in accordance with Annex III, a standard size label shall be placed in close proximity to the packaging. 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.

2.2. Light source in a containing product:

If a light source is placed on the market as a part in a containing product, the technical documentation for the containing product shall clearly identify the contained light source(s), including the energy efficiency class.

If a light source is placed on the market as a part in a containing product in a packaging containing information to be visibly displayed at a point-of-sale prior to its purchase, the following text shall be displayed, clearly legible, on the outside of the containing product's packaging:

'This product contains a light source of energy efficiency class <X>'

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

The text can be replaced by a pictogram representing a light source and including the arrow shown in Annex VII. The arrow can be in black and white.

If the product contains more than one light source, the sentence can be in the plural, or repeated per light source, as suitable. If pictograms are used, they should be repeated per light source.

The text shall be present 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.

3. **Information for products specified in Annex IV, point 3**

For the light sources specified in Annex IV, point 3, their intended use 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 (EU) 2017/1369 shall list the technical parameters that make the product design specific to qualify for the exemption.

ANNEX VI
Technical documentation

1. The technical documentation referred to in Article 3.1(d) shall include:
- (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) identification and signature of the person empowered to bind the supplier;
 - (e) technical parameters for measurements, including the declared values, as follows:
 - (1) useful luminous flux (Φ_{use}) in lm;
 - (2) colour rendering index (CRI);
 - (3) on-mode power (P_{on}) in W;
 - (4) beam angle in degrees for directional light sources (DLS);
 - (5) correlated colour temperature (CCT) in K for FL and HID light sources;
 - (6) 'standby power (P_{sb}) in W, including when it is zero;
 - (7) networked standby power (P_{net}) in W for connected light sources (CLS);
 - (8) displacement factor ($\cos \phi_1$) for LED and OLED mains light sources;
 - (9) colour consistency in MacAdam ellipse steps for LED and OLED light sources;
 - (10) flicker metric (P_{stLM}) for LED and OLED light sources;
 - (11) stroboscopic effect metric (SVM) for LED and OLED light sources;
 - (12) colour purity index, only for CTLS, for the following colours and dominant wavelength within the given range:

Colour	Dominant wave-length range
Blue	440nm — 490nm
Green	520nm — 540nm
Red	610nm — 670nm
 - (f) the calculations performed with the measured parameters, including the determination of the energy efficiency class;
 - (g) references to the harmonised standards applied or other standards used;
 - (h) testing conditions if not described sufficiently in point (f);
 - (i) the reference control settings, and instructions on how they can be implemented, where applicable;
 - (j) instructions on how to remove lighting control parts and/or non-lighting parts, if any, or how to switch them off or minimise their power consumption during light source testing;

- (k) specific precautions that shall be taken when the model is assembled, installed, maintained or tested.

ANNEX VII

Information to be provided in visual advertisements, in promotional material and in distance selling, except distance selling on the internet

1. In visual advertisements, for the purposes of ensuring conformity with the requirements laid down in Article 3(1)(e) and Article 4(1)(c), the energy class and the range of efficiency classes available on the label shall be shown as set out in point 4 of this Annex.
2. In promotional material, for the purposes of ensuring conformity with the requirements laid down in Article 3(1)(f) and Article 4(1)(d), the energy class and the range of efficiency classes available on the label shall be shown as set out in point 4 of this Annex.
3. Any paper-based distance selling must show the energy class and the range of efficiency classes available on the label as set out in point 4 of this Annex.
4. The energy class and the range of efficiency classes shall be shown, as indicated in Figure 1, with:
 - (a) an arrow containing the letter of the energy class;
 - (b) the colour of the arrow matching the colour of the energy class, and;
 - (c) the range of available efficiency classes.



Figure 1: Coloured arrow example, with range of energy classes indicated

By derogation, if the visual advertisements, promotional material or paper-based distance selling is printed in black and white, the colour of the arrow can be in black and white in that visual advertisements, promotional material or paper-based distance selling.

5. Telemarketing-based distance selling must specifically inform the customer of the energy class of the product and of the range of energy classes available on the label, and that the customer can access the full label and the product information sheet through a free access website, or by requesting a printed copy.
6. For all the situations mentioned in points 1, 2, 3 and 5, it must be possible for the customer to access the full label and the product information sheet through a link to the product database website, or to request a printed copy.

ANNEX VIII

Information to be provided in the case of distance selling on the internet

1. The appropriate label made available by suppliers in accordance with Article 3(1)(g) 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 for the standard label 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.

2. 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 the energy efficiency class of the product in white in a font size equivalent to that of the price; and
 - (c) have one of the following two formats:



3. In the case of nested display, the sequence of display of the label shall be as follows:
 - (a) the image referred to in point 2 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 upon failure to display the label, shall be the energy efficiency class of the product in a font size equivalent to that of the price.
4. The appropriate product information sheet made available by suppliers in accordance with Article 3(1)(h) 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 or by referring to the product database established under Regulation (EU) 2017/1369, 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 IX

Verification procedure for market surveillance purposes

The verification tolerances defined in this Annex relate only to the verification of the measured parameters by Member State authorities. These tolerances 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 on the product information sheet shall not be more favourable for the supplier than the values reported in the technical documentation.

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

1. The Member State authorities shall verify one single unit of the model for points 2(a) and 2(b) of this Annex.

The Member State authorities shall verify 10 units of the light source model, supplied from at least two different sources, for point 2(c) of this Annex. If the acquisition costs for the 10 units exceed 500 euros, the authorities of the Member State may reduce the sample size to 3 units. The verification tolerances are laid down in Table 6 of this Annex.
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; and
 - (c) when the authorities of the Member State test the units of the model, the determined values comply with the respective verification tolerances as given in Table 6 of this Annex, where ‘determined value’ means the arithmetical mean over the tested units of the measured values for a given parameter or the arithmetical mean of parameter values calculated from other measured values.
3. If the results referred to in point 2(a) or (b) are not achieved, the model and all models that have been listed as equivalent models in the supplier’s technical documentation shall be considered not to comply with this Regulation.
4. If the result referred to in point 2(c) is not achieved, the model and all models that have been listed as equivalent models in the supplier's technical documentation shall be considered not to comply with this Regulation.
5. The authorities of the Member State shall provide all relevant information to the authorities of the other Member States and to the Commission without delay after a decision is taken on the non-compliance of the model in accordance with points 3 and 4 of this Annex.

The authorities of the Member State shall only apply the verification tolerances that are set out in Table 6 and shall use only the procedure described in this Annex. No other tolerances, such as those set out in harmonised standards or in any other measurement method, shall be applied.

Table 6

Parameter	Sample size	Verification tolerances
Full-load on-mode power P_{on} [W]:		
$P_{on} \leq 2W$	3	The determined value shall not exceed the declared value by more than 0,20 W.
	10	The determined value shall not exceed the declared value by more than 0,20 W.
$2W < P_{on} \leq 5W$	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 %.
$5W < P_{on} \leq 25W$	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 %.
$25W < P_{on} \leq 100W$	3	The determined value shall not exceed the declared value by more than 7.5 %.
	10	The determined value shall not exceed the declared value by more than 5 %.
$100W < P_{on}$	3	The determined value shall not exceed the declared value by more than 5 %.
	10	The determined value shall not exceed the declared value by more than 2.5 %.
Displacement factor [0-1]	3	The determined value shall not be less than the declared value minus 0,1 units.
	10	The determined value shall not be less than the declared value minus 0,1 units.
Useful luminous flux Φ_{use} [lm]	3	The determined value shall not deviate from the declared by more than 10 %.
	10	The determined value shall not deviate from the declared by more than 5 %.
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 and R9 [0-100]	3	The determined value shall not be less than the declared value by more than 3,0 units.
	10	The determined value shall not be less than the declared value by more than 2,0 units.
Flicker [P_{st} LM] and stroboscopic effect [SVM]	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 %.
Colour consistency [MacAdam ellips steps]	3	The determined number of steps shall not exceed the declared number of steps. The centre of the MacAdam ellipse shall be the centre declared by the supplier with a tolerance of 0,01 units.
	10	The determined number of steps shall not exceed the declared number of steps. The centre of the MacAdam ellipse shall be the centre declared by the supplier with a tolerance of 0,005 units.
Beam angle (degrees)	3	The determined value shall not deviate from the declared

		value by more than 25 %.
	10	The determined value shall not deviate from the declared value by more than 25 %.
Efficacy [lm/W]	3	The determined value (quotient) shall not be less than the declared value minus 10 %.
	10	The determined value (quotient) shall not be less than the declared value minus 5 %.
L₇₀B₅₀ lifetime (for LED and OLED)	3	The determined value shall not be less than the declared value minus 20 %.
	10	The determined value shall not be less than the declared value minus 10 %.
Lumen maintenance factor (for LED and OLED)	3	The determined X _{LMF} % of the sample shall not be less than X _{LMF, MIN} % according to the text in Annex V of Regulation <i>[OP – please insert here the number of the accompanying ecodesign regulation for light sources and separate control gears (review)]</i> .
	10	
Survival factor (for LED and OLED)	3	All 3 light sources of the test sample must be operational after completing the test in Annex V of Regulation <i>[OP – please insert here the number of the accompanying ecodesign regulation for light sources and separate control gears (review)]</i>
	10	At least 9 light sources of the test sample must be operational after completing the endurance test in Annex V of Regulation <i>[OP – please insert here the number of the accompanying ecodesign regulation for light sources and separate control gears (review)]</i> .
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 90 % of the declared value.
Survival factor (for FL and HID)	3	The determined value shall not be less than the declared value.
	10	The determined value shall not be less than the declared value.
Colour purity index [%]	3	The determined value shall not be less than the declared value minus 10 %.
	10	The determined value shall not be less than the declared value minus 5 %.
Correlated colour temperature [K]	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 %.
Luminous peak intensity [cd]	3	The determined value shall not deviate from the declared value by more than 25 %.
	10	The determined value shall not deviate from the declared value by more than 25 %.

For light sources with linear geometry which are scalable but of very long length, such as LED strips or strings, verification testing of market surveillance authorities shall consider a length of 50 cm, or, if the light source is not scalable there, the nearest value to 50 cm. The light source supplier shall indicate which control gear is suitable for this length.

When verifying if a product is a light source, market surveillance authorities shall compare the measured values for chromaticity coordinates (x and y), luminous flux, luminous flux density, and colour rendering index directly with the limit values set out in the definition for light source of Article 2 of this Regulation, without applying any tolerances. If any of the 3 or 10 units in the sample satisfies the conditions for being a light source, the product model shall be considered to be a light source.