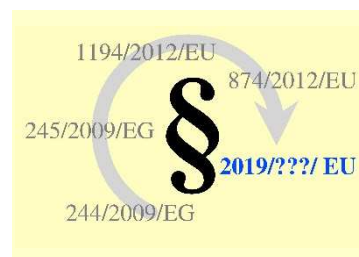


Texte zu den geplanten neuen EU-Regelungen zur umweltgerechten Produktgestaltung und zur Energieverbrauchs-kennzeichnung in der Beleuchtung – Zusammenstellung ^[1] des Umweltbundesamtes (UBA), Deutschland



Entwürfe der EU-Kommission vom 16. November 2018

Entwurf der EU-Kommission für eine Regelung mit Anforderungen an die Produktinformation bei Lichtquellen

– Begründungstext, Haupttext und 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 ^[1] of the Federal Environment Agency (UBA), Germany

The EU Commission's drafts of 16 November 2018

Draft of the EU Commission for a regulation with requirement on information on light sources

– Explanatory Memorandum, Main text and 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 ^[1] de l'Agence Fédérale de l'Environnement (UBA), Allemagne

Les projets de la Commission Européenne du 16 novembre 2018

Projet de la Commission Européenne pour une réglementation en matière d'information sur sources lumineuses

– mémoire explicatif, texte principal et 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.

^[1] <https://www.eup-network.de/de/eup-netzwerk-deutschland/offenes-forum-eu-regelungen-beleuchtung/dokumente/texte/>

Liste der EU-Kommissionsdokumente vom 16. November 2018 und Kennzeichnung des vorliegenden Textes

Texte im Offenen Forum

- **Bestehende Regelungen**
- **Studien der EU-Kommission**
- **Regelungsentwürfe**
 - EK-Vorentwürfe vom November 2015 für das Konsultationsforum
 - VHK-Entwürfe vom Sommer 2016 (nicht im Offenen Forum verfügbar)
 - VHK-Entwürfe vom Sommer 2017 (nicht im Offenen Forum verfügbar)
 - EK-Entwürfe vom November 2017 für das Konsultationsforum
 - EK-Entwürfe vom Juli 2018 für die dienststellenübergreifende Konsultation
 - EK-Entwürfe vom Oktober 2018 für die WHO-Notifizierung
 - **EK-Entwürfe vom November 2018 für den Regelungsausschuß zur Produktgestaltung und das Fachgespräch zur Produktinformation**
 - **EK-Texte**
 - Produktgestaltung (Begründungstext, Haupttext und Anhang)
 - **Produktinformation (Begründungstext, Haupttext und Anhang)**
 - Arbeitshilfen/Hintergrundtexte
- **Öffentliche Konsultationen auf EU-Ebene**
- **Diskussion im Offenen Forum**
- **Weitere Dokumente**

Inhaltsverzeichnis

A Begründungstext	2
1. Zusammenhang des delegierten Rechtsaktes	2
Gesamtzusammenhang	2
2. Konsultationen vor der Verabschiedung des Rechtsaktes	3
Anhörung interessierter Kreise	3
Folgenabschätzung	4
3. Rechtliche Bestandteile des delegierten Rechtsaktes	5
1. Geltungsbereich	5
2. Energieeffizienzklassen	5
3. Energieetikett	6
4. Umsetzung der Anforderungen an die Produktinformation.....	6
5. Nachprüfungsverfahren zur Marktaufsicht	6
6. Anwendungsbeginn.....	7
 B Haupttext	 8
Artikel 1: Gegenstand und Geltungsbereich	9
Artikel 2: Begriffsbestimmungen.....	9
Artikel 3: Pflichten der Lieferanten	12
Artikel 4: Pflichten der Händler	13
Artikel 5: Pflichten der Internetplattformen	13
Artikel 6: Meßverfahren.....	13
Artikel 7: Nachprüfungsverfahren zur Marktaufsicht	14
Artikel 8: Überprüfung.....	14
Artikel 9: Aufhebung	14
Artikel 10: Inkrafttreten und Geltung	14

C Anhänge15

Hinweis: Das Inhaltsverzeichnis führt nur die Tafeln 1, 2 und 6 auf. Tafeln mit den Nummern 3, 4 und 5 gibt es im Entwurfstext nicht.

Anhang I: Begriffsbestimmungen für die Zwecke der Anhänge.....	16
Anhang II: Energieeffizienzklassen und Berechnungsmethode.....	23
Tabelle 1: Energieeffizienzklassen von Lichtquellen.....	23
Tabelle 2: Faktor F_{TM} von Lichtquellentypen	23
Anhang III: Etikett für Lichtquellen.....	24
1. Aufkleber – Grundaufbau	24
1.1 Standardaufkleber.....	24
1.2 Aufkleber für kleine Verpackungen	24
1.3 [Informationen auf dem Aufkleber]	25
2. Aufkleber – Gestaltungselemente und Abmessungen	26
2.1 Standardaufkleber.....	26
2.2 Aufkleber für kleine Verpackungen	27
2.3 Beschreibung.....	28
Anhang IV: Ausnahmen.....	30
Anhang V: Produktinformation.....	33
1. Produktdatenblatt	33
2. Informationen, die auf der Verpackung anzugeben sind	34
2.1. Lichtquelle.....	34
2.2. Lichtquellen als eingebaute Produkte.....	35
3. Informationsanforderungen an die im Anhang I, Punkt 3 genannten Produkte	36
Anhang VI: Technikunterlagen.....	37
Anhang VII: Informationen, die in visueller Werbung, in Werbematerialien und im Falle von Fernabsatz, außer dem über Internetz anzugeben sind.....	39
Anhang VIII: Informationen, die im Falle von Fernabsatz über Internetz anzuge- ben sind	40
Anhang IX: Nachprüfungsverfahren zur Marktaufsicht	41
Tabelle 6: [Toleranzen bei der Nachprüfung]	42

EN: List of EU Commission documents as of 16 November 2018 and identification of the text at hand

Documents in the Open Forum

- **Existing EC and EU Regulations**
- **Studies of the European Commission**
- **Draft regulations**
 - EU Commission's preliminary drafts of November 2015 for the Consultation Forum
 - VHK's drafts of summer 2016 (not available in the Open Forum)
 - VHK's drafts of summer 2017 (not available in the Open Forum)
 - EU Commission's drafts of November 2017 for the Consultation Forum
 - EU Commission's drafts of July 2018 for inter-service consultation
 - EU Commission's drafts of October for WTO Notification
 - **EU Commission's drafts of November 2018 for the Regulatory Committee on ecodesign and for the Technical Expert Meeting on energy labelling**
 - **Texts of the European Commission**
 - Product design (Explanatory Memorandum, Main text and Annex)
 - **Product information (Explanatory Memorandum, Main text and Annex)**
 - Work aid/Background information
- **Public Consultations at EU level**
- **Discussion in the Open Forum**
- **Further documents**

Contents list

A Explanatory Memorandum.....	2
1. Context of the delegated act	2
General context	2
2. Consultations prior to the adoption of the act.....	3
Consultation of interested parties	3
Impact Assessment	4
3. Legal elements of the delegated act	5
1. Scope.....	5
2. Energy efficiency classes	5
3. Energy label	6
4. Implementation of product information requirements	6
5. Verification procedure for market surveillance purposes	6
6. Date of application	7
B Main Text.....	8
Article 1: Subject matter and scope	9
Article 2: Definitions.....	10
Article 3: Obligations of suppliers.....	12
Article 4: Obligations of dealers	13
Article 5: Obligations of internet hosting platforms	13
Article 6: Measurement methods	13
Article 7: Verification procedure for market surveillance purposes.....	14
Article 8: Review	14
Article 9: Repeal.....	14
Article 10: Entry into force and application	14

C Annexes15

Note: The table of contents lists only tables 1, 2, and 6. Tables numbered 3, 4 and 5 do not exist in the draft text.

Annex I:	Definitions applicable for the Annexes	16
Annex II:	Energy efficiency classes and calculation method	23
	Table 1: Energy efficiency classes of light sources.....	23
	Table 2: Factors F_{TM} by light source type	23
Annex III:	Label for light sources	24
	1. Label	24
	1.1 Standard Label.....	24
	1.2 Label for small packaging	24
	1.3 [Information included in label for light sources].....	25
	2. Label design	26
	2.1 Standard Label.....	26
	2.2 Label for small packaging	27
	2.3 Description	28
Annex IV:	Exemptions	30
Annex V:	Product information	33
	1. Product information sheet.....	33
	2. Information to be placed on the packaging.....	34
	2.1 Light source.....	34
	2.2 Light source in a containing product.....	35
	3. Information for products specified in Annex I point 3	36
Annex VI:	Technical documentation	37
Annex VII:	Information to be provided in visual advertisements, in promotional material and in distance selling except distance selling on the internet	39
Annex VIII:	Information to be provided in the case of distance selling through the Internet	40
Annex IX:	Verification procedure for market surveillance purposes	41
	Table 6: [Verification tolerances].....	42

FR : Liste des documents de la Commission européenne du 16 novembre 2018 et marquage du présent document

Documents dans le forum ouvert

- **Règlements existants de la CE et de l'EU**
- **Études de la Commission européenne**
- **Projets de règlements**
 - Avant-projets de la Commission Europ. du novembre 2015 pour le forum consultatif
 - Projets de VHK de l'été 2016 (non disponibles sur le forum ouvert)
 - Projets de VHK de l'été 2017 (non disponibles sur le forum ouvert)
 - Projets de la Commission Europ. du novembre 2017 pour le forum consultatif
 - Projets de la Commission Europ. du juillet 2018 pour la consultation inter-services
 - Projets de la Commission Europ. d'octobre 2018 pour la notification à l'OMC
 - **Projets de la Comm. Europ. du nov. 2018 pour le comité de réglementation et pour la réunion d'experts technique sur étiquetage énergétique**
 - **Textes de la Commission européenne**
 - Conception des produits (mémoire explicatif, texte principal et annexe)
 - **Informations relatives aux produits (mémoire explicatif, texte principal et annexe)**
 - Aide de travail/Informations de fond
- **Consultations publiques au niveau de l'UE**
- **Discussion dans le Forum Ouvert**
- **Autres documents**

Table des matières

A Mémoire explicatif2

1. Contexte du acte délégué	2
Contexte général	2
2. Consultations pendant la phase précédant l'adoption de l'acte.....	3
Consultation des parties intéressée	3
Analyse d'impact.....	4
3. Éléments juridiques du acte délégué	5
1. Champ d'application	5
2. Classes d'efficacité énergétique.....	5
3. Étiquetage énergétique.....	6
4. Mise en œuvre des exigences relatives aux informations relatives au produit	6
5. Procédure de vérification aux fins de la surveillance du marché.....	6
6. Date d'application.....	7

B Texte principal.....8

Article premier : Objet et champ d'application	9
Article 2 : Définitions.....	9
Article 3 : Obligations des fournisseurs.....	9
Article 4 : Obligations des revendeurs.....	13
Article 5 : Obligations des plateformes d'hébergement internet.....	13
Article 6 : Méthodes de mesure	13
Article 7 : Procédure de vérification aux fins de la surveillance du marché.....	14
Article 8 : Révision.....	14
Article 9 : Abrogation.....	14
Article 10 : Entrée en vigueur et application	14

C Annexes.....15

Note : La table des matières répertorie uniquement les tables 1, 2 et 6. Il n'y a pas de tableaux numérotés 3, 4 et 5 dans le projet de texte.

Annexe I : Définitions applicables aux fins des annexes..... 16

Annexe II : Classes d'efficacité énergétique et méthode de calcul 23

Tableau 1 : Classes d'efficacité énergétique de source lumineuses 23

Tableau 2 : Facteur F_{TM} des sources lumineuses..... 23

Annexe III : Étiquetage pour sources lumineuses 24

1. Étiquette – structure de base 24

1.1 Étiquette normale24

1.2 Étiquette pour petits emballages24

1.3 [Informations sur l'étiquette pour sources lumineuses].....25

2. Étiquette – éléments du design et dimensions 26

2.1 Étiquette normale26

2.2 Étiquette pour petits emballages27

2.3 Description27

Annexe IV : Exemptions 30

Annexe V: Information relative au produit 33

1. Fiche d'information sur le produit..... 33

2. Informations à faire figurer sur l'emballage 34

2.1. Source lumineuse34

2.2. Source lumineuse comme un produit intégrée35

3. Exigences d'information applicables aux produits précisées à l'annexe
I point 3 36

Annexe VI: Documentation technique 37

Annexe VII: Informations à fournir dans publicité visuelle, dans matériel de promotion et dans le cas de vente à distance, sauf sur l'internet 39

Annexe VIII: Informations à fournir dans les cas de vente à distance sur l'internet 40

Annexe IX: Procédure de vérification aux fins de la surveillance du marché..... 41

Tableau 6 : [Tolérances utilisées dans la vérification] 42

Es folgt ein Originaltext, der vom Herausgeber zur besseren Orientierung durch einen Fußzeilentext sowie eine durchgehende Seitennumerierung ergänzt wurde. Zwecks Unterscheidung wurden diese Ergänzungen in {roter Schrift} vorgenommen. Dabei verwendete Abkürzungen: • EK-Ew = Entwürfe der EU-Kommission • PI = Produktinformation • A = Begründungstext • B = Haupttext • C = Anhang)

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

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

of XXX

**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

(Text with EEA relevance)

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.

EXPLANATORY MEMORANDUM

1. CONTEXT OF THE DELEGATED ACT

Regulation (EU) 2017/1369 of the European Parliament and of the Council¹ establishes a framework for adopting regulations on EU-wide energy labelling of energy-related products and repeals the previous framework set out in Directive 2010/30/EU. Energy labelling is a key EU policy instrument for informing consumers about the energy efficiency and other environmental performance aspects of energy-related products placed on the internal market. The energy label is recognised and used by 85 % of Europeans².

Under this framework, the energy labelling measures applicable to lighting products are in:

- Commission Delegated Regulation (EU) No 874/2012³ of 12 July 2012 with regard to energy labelling of electrical lamps and luminaires;
- as amended by Commission Delegated Regulation (EU) No 518/2014⁴ of 5 March 2014 with regard to labelling of energy-related products on the internet.

The revision of the energy labelling measure for lighting products follows Article 7 of Regulation (EU) No 874/2012. In particular, this review should assess verification tolerances.

Article 11 of the Energy Labelling Framework Regulation lists five priority product groups for which new delegated acts with rescaled energy labels must be adopted by 2 November 2018. Lighting is one of the priority product groups. Therefore, a new delegated act for the energy labelling of lighting products must be adopted so that products currently ranging from A++ to E can be rescaled from A to G to address the overpopulation of the top classes.

Also, there are new policies that require the revision to look beyond the strict scope mentioned in the review articles of the existing acts for lighting products. These new policies include a renewed effort to reduce green house gas emissions through the Paris climate agreement⁵, the Commission's circular economy action plan⁶, the Better Regulation policy for more efficient and effective legislation⁷ and the need to address possible circumvention of testing standards⁸.

This act is developed in parallel with the proposed act for the ecodesign of lighting products.

General context

In 2014, the Commission conducted an 'Omnibus' review⁹ of several product groups that indicated that there is still a large untapped energy saving potential for lighting products. This made the acts on ecodesign and energy labelling eligible for revision. This was confirmed by

¹ OJ L 198, 28.7.2017, p. 1-23.

² [Study on the impact of the energy label — and potential changes to it — on consumer understanding and on purchase decisions — . LE London Economics and IPSOS, October 2014.](#)

³ OJ L 258, 26.9.2012, p. 3.

⁴ OJ L 147, 17.5.2014, p. 1-28.

⁵ http://ec.europa.eu/clima/policies/international/negotiations/future/index_en.htm.

⁶ Closing the loop — An EU action plan for the Circular Economy'. COM(2015) 614 final, Brussels, 2.12.2015.

⁷ http://ec.europa.eu/smart-regulation/better_regulation/key_docs_en.htm#_br.

⁸ <http://www.europarl.europa.eu/committees/en/emis/home.html>.

⁹ 'Omnibus' Review Study on Cold Appliances, Washing Machines, Dishwashers, Washer-Driers, Lighting, Set-top Boxes and Pumps, consortium of VHK, VITO, Viegand Maagøe, Wuppertal Institut für Klima, Umwelt, Energie for the European Commission, DG ENER-C3, Brussels/Delft, April 2014.

the review studies, in particular the Lot 8/9/19 review study concluded in October 2015¹⁰ for which consultants developed MELISA, the ‘Model for European Light Sources Analysis’.

In the European Commission's 2016-2019 ecodesign working plan¹¹, the revision of the implementing acts for lighting products is mentioned as one of the major energy saving opportunities, with 125 TWh of primary energy savings per year expected in 2030 (combined effect of ecodesign and energy labelling).

In 2015, around 1,7 billion light sources were sold in the 28 EU Member States, of which approximately 22 % based on LED technology. In the same year, around 11,4 billion light sources were operating in EU-28, of which 6,5 % LED. These light sources consumed a total of 336 TWh/a of electricity, covering 12,4 % of the overall EU-28 electricity use. This corresponded to greenhouse gas emissions of 132 megatons of CO₂ equivalent per year (MtCO₂eq/a), i.e. 2,8 % of the overall greenhouse gas emissions in EU-28.

Impact data from October 2017, based on the latest version of the MELISA model, estimates that this act on energy labelling of light sources will reduce the electricity consumption for lighting by 2030, reaching 11 TWh/y of electricity savings, in addition to 40-42 TWh/y from the ecodesign act¹².

2. CONSULTATIONS PRIOR TO THE ADOPTION OF THE ACT

Consultation of interested parties

There was extensive consultation of stakeholders during the review studies and before and after the Consultation Forum meetings. Further external expertise was collected and analysed during this process.

Stakeholders (industry, Member States, NGOs) were consulted during the Lot 8/9/19 review study in two occasions. A first stakeholder meeting was held on 5 February 2015 on the MEErP (¹³) Task 0, 1, 2 and 3 reports; a second meeting was held on 17 June 2015 on the Task 4, 5 and 6 reports.

Study reports were updated to reflect stakeholders' comments. Importantly, the future projections for LED prices and LED efficiencies used in the analysis of the MELISA model were agreed with industry. Stakeholder comments were also taken into account when preparing the Commission working document for the Ecodesign Consultation Forum (ECF) of 7 December 2015.

The comments on the 2015 working document showed a lack of consensus among stakeholders on the general approach, on the level of ambition and on many details, especially for the ecodesign part. To resolve this situation and address the different comments, additional stakeholder meetings were held after the 2015 ECF, between spring 2016 and spring 2017. The MELISA model was extensively discussed with industry experts and adapted accordingly.

A second ECF took place on 7 December 2017.

¹⁰ Preparatory Study on Light Sources for Ecodesign and/or Energy Labelling Requirements ('Lot 8/9/19'), Task reports 0-7, VHK for the European Commission, October 2015. <http://ecodesign-lightsources.eu/documents>.

¹¹ COM(2016) 773 final, Brussels, November 2016.

¹² Which, altogether, are around 125 TWh of primary energy savings mentioned in the Working Plan 2016-2019, applying the primary energy factor for electricity generation from Directive 2012/27/EU.

¹³ MEErP is the methodology that the European Commission applies to make studies for the ecodesign of energy-related products.

An online public consultation was held from 12 February to 7 May 2018 to collect stakeholders' views on issues such as the expected effect of potential legislative measures on business and on energy consumption trends.

The consultation contained a common part on ecodesign and energy labelling, followed by product-specific questions on (i) refrigerators, (ii) dishwashers, (iii) washing machines, (iv) televisions, (v) electronic displays and (vi) lighting.

1230 responses were received of which 67 % from consumers and 19 % from businesses (of which three quarters were SMEs and one quarter large companies). Non-governmental organisations made up 6 % of the respondents, and 7 % were 'other' categories. National or local governments accounted for less than 1 % of the respondents, and 0,25 % came from national market surveillance authorities.

The countries of residence of the participants were predominantly the UK (41 %) and Germany (26 %), with a second group residing in Austria, Belgium, France, the Netherlands and Spain and together comprising some 17 %. Nine other Member States comprised another 9,5 % of the replies, but residents in 12 EU Member States gave either zero or a negligible number of responses. Non-EU respondents comprised around 5 % of the replies.

All the respondents except one (1229 out of 1230) answered the questions on lighting products. 719 participants (58 %) replied only to lighting.

Impact assessment

An impact assessment is required when the expected economic, environmental or social impacts of EU action are likely to be significant. The impact assessment for the review of Regulations (EC) No 874/2012 and No 244/2009, No 245/2009 and No 1194/2012 was carried out between May 2017 and March 2018.

The data collected in the review studies served as a basis for the impact assessment. Additional data and information were collected and discussed by the impact assessment study team with industry, experts and other stakeholders, including Member States. During this process, several meetings were organised with industry and Member State experts. The additional data and information collection focused on:

- additional market data on energy efficiency for 2015-2017;
- an update on lighting catalogues for the availability of LED replacements;
- fine-tuning of the requirements;
- fine-tuning of definitions;
- investigation of various options for the phase-out of T8 lamps;
- sensitivity analysis of electricity tariffs;
- extended information on SMEs, possible impacts;
- extended information on specific sectors using T8 lamps.

The impact assessment report was submitted to the Regulatory Scrutiny Board (RSB) on 16 May 2018. Following a meeting on 13 June 2018, on 18 June 2018 the RSB delivered a positive opinion with reservations. The draft impact assessment was subsequently improved, based on the RSB's Opinion¹⁴ and the horizontal and specific technical comments that the RSB sent prior to the meeting of 13 June 2018. The main consideration for energy labelling was that the report should better explain the value added for consumers of maintaining an

¹⁴ Ref. Ares(2018)3220771 - 18/06/2018

energy label. Text was added to better explain that the overall effect at 2030 for consumers (considering acquisition costs and electricity costs) is positive for all the assessed options.

In addition, inception impact assessments for the regulatory measures on the review of ecodesign and energy labelling requirements for this product group were published on 26 January 2018 for feedback by 23 February 2018. In total, 17 comments were received for the ecodesign measure and 16 for the energy labelling measure.

In general, all stakeholders are in favour of ecodesign and energy labelling requirements for lighting products. The feedback commented among other things on the strictness of ecodesign requirements, the quality of light, the blue light content and requirements that would make light sources easily replaceable//repairable in products that contain light sources (so-called ‘containing products’).

3. LEGAL ELEMENTS OF THE DELEGATED ACT

1. Scope

The scope of the measures is light sources. Light sources as defined by this act are always in the scope, even when they are parts of ‘containing products’, such as luminaires, mirrors, fridges or shelves. However, the containing products themselves are not in the scope of this act (but they may be in the scope of other energy labelling acts). This means that this act eliminates the energy labelling requirement for luminaires set out in Regulation (EU) No 874/2012.

The scope covers all lighting technologies, including incandescent, halogen, fluorescent, high-intensity discharge and light-emitting diodes (both inorganic LED and organic OLED).

The definition of light sources is the same as that in the proposed act for ecodesign. However, fewer products are exempt under energy labelling than in the ecodesign act. In the Ecodesign Regulation, it is important to avoid the risk that light sources with special characteristics are unintentionally removed from the market. However, energy labelling of these light sources is useful, because the label will indicate the price to be paid, in terms of lower energy efficiency, to have the special characteristics. Thus, there will be light sources which are exempt from ecodesign requirements but not from the energy labelling.

2. Energy efficiency classes

A new formula for energy labelling is proposed that better reflects energy efficiency and is more intuitive in the calculation than the energy efficiency index set out in the current energy labelling regulation. In the new metrics, the limits for the energy efficiency classes have been defined directly in terms of light source efficiency, as a result of the total light output of a light source (in lumen, lm) divided by the mains (230 V) power input (in Watt, W) and expressed as lm/W. This change implies that to obtain a given energy efficiency class, light sources with high light output do not need a higher efficiency than light sources with low light output. This is reasonable, considering that when the new energy labelling requirements start to apply, the label classes will mainly aim to differentiate between LEDs based on their respective efficiencies.

For directional light sources, where normally only the part of light output in a cone is taken into account, and for non-mains light sources (not taking 230 V as input), correction factors are applied to convert their efficacy to an efficacy comparable to the limits of the energy efficiency classes.

Class limits are proposed with a 25 lm/W difference between consecutive classes: all light sources above 210 lm/W are class A. All light sources below 85 lm/W are class G.

As of June 2018, there are no light sources on the market that can meet the efficiency limits of classes A and B (but there are at laboratory level). So these classes would initially be empty, as required by Regulation (EU) 2017/1369. The best LED light sources typically used by households today on the market would have the new label class E; the best LED light sources for professional use today on the market would be class D and by 2021 some would be expected to be class C. In 2021, when the new classes will start to apply, class A is still expected to be empty while there might already be some class B light sources on the market.

In the highly dynamic light sources market, it is not an easy task to predict the share of models that will fall in class A around 2030, but it is unlikely that an update of the classes would be necessary within 10 years of the introduction. Therefore, in such case the requirements of Regulation (EU) 2017/1369 would be met.

3. Energy label

The label is reviewed and updated following the instructions in the new framework Regulation (EU) 2017/1369. The general principle is that the label has to be displayed on the side of the packaging facing the potential buyer at the point of sale (visibility objective). Light sources packages can be small. The tailor-made solution for small packages is to have the label on the rear of the packaging, with a coloured arrow with the energy efficiency class displayed on the front.

If the light source is sold inside a containing product (e.g. a luminaire), it would be confusing to attach a label for the light source to the packaging of the containing product. Hence, in this case, a label is not required, but the packaging of the containing product must display a text declaring the energy efficiency class of the contained light source.

Re-labelling of existing products is required only for those products which stay unsold with dealers for more than 9 months from the date of application of the new measures (with a sticker); otherwise those products cannot be sold anymore.

4. Implementation of product information requirements

The delegated act specifies the list of lighting parameters and other information:

- to be displayed on the light source itself and on packaging,
- to be entered in the public part of the product database established pursuant to Regulation (EU) 2017/1369 (this part can be printed as the product information sheet),
- to be entered in the compliance part of the product database established pursuant to Regulation (EU) 2017/1369 (this is a part of the technical documentation).

The list of parameters to be entered in the product database includes not only information strictly related to the energy label and its verification. The list also includes all information useful for end-users and for market surveillance authorities to verify compliance with the ecodesign regulation on light sources, which is developed in parallel.

5. Verification procedure for market surveillance purposes

The procedure to be used by market surveillance authorities to verify the compliance of light sources with this Regulation is aligned with Commission Regulation (EU) 2016/2282¹⁵ which is based on verification of parameter values declared by suppliers. In addition, the required number of samples has been reduced. This will facilitate market surveillance activities and remove some ambiguities.

¹⁵ OJ L 346, 20.12.2016, p. 51.

For verification tolerances, the approach has been diversified, using different tolerances for different parameters and depending on the sample size.

6. Date of application

It is the Commission's intention for this act to apply from the same date of application of the ecodesign act which is developed in parallel. The existing energy labelling regulation for lighting products (Regulation (EU) No 874/2012) will be repealed from the day of application, with the exception of Article 3(2) and Article 4(2) of Regulation (EU) No 874/2012, which will be repealed from the date of entry into force of this act.

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

of XXX

**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

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

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

Having regard to Regulation (EU) 2017/1369 of the European Parliament and of the Council of 28 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU¹⁶, in particular Article 11(5) and Article 16(1) thereof,

Whereas:

- (1) Regulation (EU) 2017/1369 of the European Parliament and of the Council empowers the Commission to adopt delegated acts as regards the labelling or rescaling of the labelling of product groups representing significant potential for energy savings and, where relevant, other resources.
- (2) The Ecodesign Working Plan 2016-2019¹⁷ established by the Commission in application of Article 16(1) of Directive 2009/125/EC of the European Parliament and of the Council sets out the working priorities under the ecodesign and energy labelling framework for the period 2016-2019. The Working Plan identifies the energy-related product groups to be considered as priorities for the undertaking of preparatory studies and eventual adoption of implementing measures, as well as the review of the current regulations.
- (3) Measures from the Working Plan have an estimated potential to deliver a total in excess of 260 TWh of annual final energy savings in 2030, which is equivalent to reducing greenhouse gas emissions by approximately 100 million tonnes per year in 2030. Lighting is one of the product groups listed in the Working Plan, with an estimated 41,9 TWh of annual final energy savings in 2030.
- (4) Provisions on the energy labelling of lighting products, namely electrical lamps and luminaires, were established by Commission Delegated Regulation (EU) No 874/2012¹⁸.

¹⁶ OJ L 198, 28.7.2017, p. 1.

¹⁷ COM(2016) 773 final of 30.11.2016.

¹⁸ Commission Delegated Regulation (EU) No 874/2012 of 12 July 2012 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of electrical lamps and luminaires (OJ L 258, 26.9.2012, p. 1).

- (5) Lighting products are among the priority product groups mentioned in Article 11(5)(b) of Regulation (EU) 2017/1369 for which the Commission should adopt a delegated act to introduce an A to G rescaled label.
- (6) Regulation (EU) No 874/2012 contains a review clause in Article 7 requiring the Commission to review the Regulation in light of technological progress.
- (7) The Commission has reviewed Regulation (EU) No 874/2012 and analysed the technical, environmental and economic aspects of lighting products as well as real-life user behaviour. The review was carried out in close cooperation with stakeholders and interested parties from the Union and third countries. The results of the review were made public and presented to the Consultation Forum established by Article 14 of Regulation (EU) 2017/1369.
- (8) The review concluded that there was a need to introduce revised energy labelling requirements for lighting products, namely for light sources.
- (9) The environmental aspect of light sources that has been identified as significant for the purposes of this Regulation is energy consumption in the use phase.
- (10) The review has shown that the electricity consumption of products subject to this Regulation can be further reduced significantly by implementing energy label measures.
- (11) As this Regulation discontinues the energy label specifically dedicated to luminaires in Regulation (EU) No 874/2012, suppliers of luminaires should be exempted from the obligations related to the product database established under Regulation (EU) 2017/1369.
- (12) Recognizing the growth of sales of energy-related products through web-stores and internet sales platforms, rather than directly from suppliers, it should be clarified that web-stores and internet sales platforms should be responsible for displaying the label provided by the supplier in proximity to the price, as from Commission Delegated Regulation (EU) No 518/2014.
- (13) The measures provided for in this Regulation were discussed by the Consultation Forum and the Member States' experts in accordance with Article 14 of Regulation (EU) 2017/1369.
- (14) Regulation (EU) No 874/2012 should therefore be repealed,

HAS ADOPTED THIS REGULATION:

Article 1

Subject matter and scope

1. This Regulation establishes requirements for the labelling of, and the provision of supplementary product information on light sources with or without integrated control gear. The requirements also apply to light sources placed on the market in a containing product.
2. This Regulation shall not apply to light sources specified in Annex IV, points 1, 2 and 4.
3. Light sources specified in Annex IV, point 3 shall comply only with the requirements of Annex V, point 3.

Article 2 Definitions

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

- (1) 'light source' means an electrically operated product intended to emit and/or be possibly tuned to emit light with all of the following optical characteristics:
 - (a) chromaticity coordinates x and y in the range:
 $0, 270 < x < 0, 530$ and
 $- 2, 3172 x^2 + 2, 3653 x - 0, 2199 < y < - 2, 3172 x^2 + 2, 3653 x - 0, 1595$;
 - (b) a luminous flux $< 500 \text{ lm per mm}^2$ of projected light-emitting surface area as defined in Annex I;
 - (c) a luminous flux between 60 and 82 000 lumen;
 - (d) a colour rendering index (CRI) $R_a > 0$;using incandescence, fluorescence, high-intensity discharge, inorganic light emitting diodes (LED) or organic light emitting diodes (OLED), or their combinations as lighting technology, and that can be verified as a light source according to the procedure of Annex IX.

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

Light sources do not include:

 - (a) LED dies or LED chips;
 - (b) LED packages;
 - (c) products containing light source(s) from which these light source(s) can be removed for verification;
 - (d) light-emitting parts contained in a light source from which these parts cannot be removed for verification as a light source.
- (2) 'control gear' means one or more devices, that can be or not physically integrated in a light source, intended to prepare the mains for the electric format required by one or more specific light sources within boundary conditions set by electric safety and electromagnetic compatibility. It may include transforming the supply and starting voltage, limiting operational and preheating current, preventing cold starting, correcting the power factor and/or reducing radio interference;
- (3) 'containing product' means a product containing one or more light sources and/or separate control gears. Examples of containing products are luminaires that can be taken apart to allow separate verification of the contained light source(s), household appliances containing light source(s), furniture (shelves, mirrors, display cabinets) containing light source(s). If a containing product cannot be taken apart for verification of the light source and separate control gear, the entire containing product is to be considered a light source;
- (4) 'light' means electromagnetic radiation with a wavelength between 380 nm and 780 nm;

- (5) 'mains' or 'mains voltage' (MV) means the electricity supply of 230 (± 10 %) Volt of alternating current at 50 Hz;
- (6) 'LED die or LED chip' means a small block of light-emitting semiconducting material on which a functional LED circuit is fabricated;
- (7) 'LED package' means a single electric part comprising principally at least one LED die. It does not include a control gear or parts of it, a cap, active electronic components and is not connected directly to the mains voltage. It is used as a part of an LED module or of an LED lamp. It can include one or more of the following: optical elements, light converters (phosphors), thermal, mechanical and electric interfaces, parts to address electrostatic discharge concerns. So called Chip-on-Board (CoB) packages, and similar light-emitting devices that are intended to be used directly in an LED luminaire, are not considered to be LED packages but LED modules;
- (8) 'chromaticity' means the property of a colour stimulus defined by its chromaticity coordinates (x and y);
- (9) 'luminous flux' or 'flux' (Φ), expressed in lumen (lm), means the quantity derived from radiant flux (radiant power) by evaluating the electromagnetic radiation in accordance with the spectral sensitivity of the human eye. It refers to the total flux emitted by a light source in a solid angle of 4π steradians under conditions (e.g. current, voltage, temperature) specified in applicable standards. It refers to the initial flux for the undimmed light source after a short operating period, unless it is clearly specified that the flux in a dimmed condition or the flux after a given period of operation is intended. For light sources that can be tuned to emit different light spectra and/or different maximum light intensities, it refers to the flux in the 'reference control settings' as defined in Annex I;
- (10) 'colour rendering index' (CRI) means the effect of an illuminant on the colour appearance of objects by conscious or subconscious comparison with their colour appearance under the reference illuminant and is the average Ra of the colour rendering for the first 8 test colours (R1-R8) defined in standards;
- (11) 'incandescence' means a phenomenon where light is produced from heat, in light sources typically produced through a threadlike conductor ('filament') which is heated by the passage of an electric current. Incandescent light sources include GLS – general lamp shape light sources and halogen light sources;
- (12) 'halogen light source' means an incandescent light source with a threadlike conductor made from tungsten surrounded by gas containing halogens or halogen compounds;
- (13) 'fluorescence' or 'fluorescent light source' (FL) means the phenomenon or a light source using an electric gas discharge of the low-pressure mercury type in which most of the light is emitted by one or more layers of phosphors excited by the ultraviolet radiation from the discharge. Fluorescent light sources may have one ('single-capped') or two ('double-capped') connections ('caps') to their electricity supply. For the purposes of this Regulation, magnetic induction light sources are also considered as fluorescent light sources;
- (14) 'high intensity discharge' (HID) means an electric gas discharge in which the light-producing arc is stabilised by wall temperature and the arc chamber has a bulb wall loading in excess of 3 Watts per square centimetre. HID light sources are limited to metal halide, high-pressure sodium and mercury vapour types as defined in Annex I;

- (15) 'gas discharge' means a phenomenon where light is produced, directly or indirectly, by an electric discharge through a gas, plasma, metal vapour or mixture of gases and vapours;
- (16) 'inorganic light emitting diode' (LED) means a technology in which light is produced from a solid state device embodying a p-n junction of inorganic material. The junction emits optical radiation when excited by an electric current;
- (17) 'organic light emitting diode' (OLED) means a technology in which light is produced from a solid state device embodying a p-n junction of organic material. The junction emits optical radiation when excited by an electric current;
- (18) '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;
- (19) 'point of sale' means a physical location where the product is displayed or offered for sale, hire or hire-purchase to the end-user;
- (20) 'end-user' means a natural person buying or expected to buy a product for purposes that are outside his trade, business, craft or profession.

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

Article 3 **Obligations of suppliers**

- 1. Suppliers of light sources shall ensure that:
 - (a) each light source which is placed on the market as an independent product (i.e. not in a containing product) and in a packaging containing information to be visibly displayed to potential buyers prior to their purchase, is supplied with a printed label in the format as set out in Annex III;
 - (b) the parameters of the product information sheet, as set out in Annex V, are entered into the product database established by Regulation (EU) 2017/1369;
 - (c) if requested by the dealer, the product information sheet shall be made available in printed form;
 - (d) the content of the technical documentation uploaded into the product database is in accordance with Annex VI;
 - (e) any visual advertisement for a specific model of light source, including on the internet, contains the energy efficiency class of that model and the range of efficiency classes available on the label, in accordance with Annex VII;
 - (f) any technical promotional material concerning a specific model of light source, including on the internet, which describes its specific technical parameters includes the energy efficiency class of that model and the range of efficiency classes available on the label, in accordance with Annex VII;
 - (g) an electronic label in the format and containing the information, as set out in Annex VIII, is made available to dealers for each light source model;
 - (h) an electronic product information sheet, as set out in Annex VIII, is made available to dealers for each light source model;

- (i) upon request by dealers and in accordance with Article 4(e), printed labels to rescale products are provided as a sticker, of the same size as the one which already exists.
- 2. Suppliers of containing products shall:
 - (a) provide information on the contained light source(s), as specified in Annex V, point 2.2;
 - (b) as specified in Annex IX, upon request by market surveillance authorities, provide information on how light sources can be removed for verification without permanent damage.
- 3. The energy efficiency class shall be calculated in accordance with Annex II.

Article 4 **Obligations of dealers**

Dealers shall ensure that:

- (a) each light source, at the point of sale, bears the label provided by suppliers in accordance with point (a) of Article 3, with the label being displayed in such a way as to be clearly visible, as indicated in Annex III;
- (b) in the event of distance selling, the label and product information sheet are provided, in accordance with Annexes VII and VIII;
- (c) any visual advertisement for a specific model of light source contains the energy efficiency class of that model and the range of efficiency classes available on the label, in accordance with Annex VII;
- (d) any technical promotional material concerning a specific model of light source, including technical promotional material on the internet, which describes its specific technical parameters includes the energy efficiency class of that model and the range of efficiency classes available on the label, in accordance with Annex VII;
- (e) existing labels on light sources at points of sale are replaced by the rescaled labels in such a way as to cover the existing label, including when printed on or attached to the package, within nine months after the application of this Regulation.

Article 5 **Obligations of internet hosting platforms**

Where a hosting service provider as referred to in Article 14 of Directive 2000/31/EC of the European Parliament and of the Council allows the selling of light sources through its internet site, the service provider shall enable the showing of the electronic label and electronic product fiche sheet provided by the dealer on the display mechanism in accordance with the provisions of Annex VIII and shall inform the dealer of the obligation to display them.

Article 6 **Measurement methods**

The information to be provided pursuant to Articles 3 and 4 shall be obtained by reliable, accurate and reproducible measurement and calculation methods, which take into account the recognised state-of-the-art measurement and calculation methods set out in Annex II.

Article 7

Verification procedure for market surveillance purposes

Member States shall apply the verification procedure laid down in Annex IX to this Regulation when performing the market surveillance checks referred to in Article 8(3) of Regulation (EU) 2017/1369.

Article 8

Review

The Commission shall review this Regulation in the light of technological progress and present the results of this review, including, if appropriate, a draft revision proposal, to the Consultation Forum no later than *[OP – please insert the date - five years after day of entry into force of this Regulation]*. The review shall in particular assess the energy efficiency classes and the possibility of introducing requirements for the circular economy.

Article 9

Repeal

Regulation (EU) No 874/2012 is repealed with effect from 1 September 2021, with the exception of Articles 3(2) and 4(2) which are repealed with effect from *[OP: please insert the day of entry into force of this Regulation]*.

Article 10

Entry into force and application

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

It shall apply from 1 September 2021. However, Article 3(1)(b) shall apply from 1 May 2021 and Article 4(e) shall apply from 1 June 2022.

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

Done at Brussels,

For the Commission
Jean-Claude JUNCKER
The President



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;

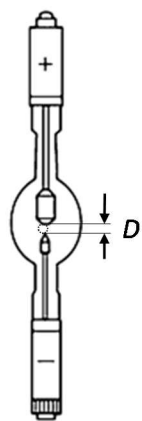
- (30) 'LFL T5-HO' means a high-output linear fluorescent T5 light source with driving current higher than or equal to 0,2 A;
- (31) 'HL R7s' means a mains-voltage, double-capped, linear halogen light source with a cap diameter of 7 mm;
- (32) 'battery-operated' means a product that operates only on 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 mm² (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).

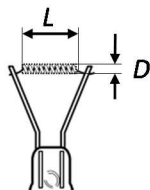
For light sources with a non-clear envelope or with anti-glare shield, the light-emitting surface area is the entire area through which light leaves the light source.

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.

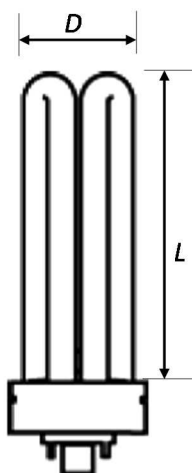
For HID light sources definition (a) applies, unless the dimensions defined in (d) apply with $L > D$, where L is the distance between the electrode tips and D the inner diameter of the arc tube.



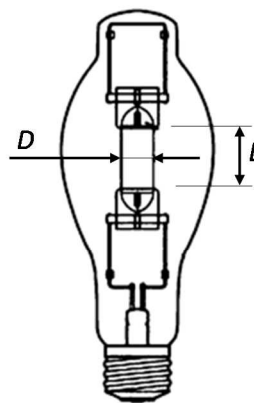
(a)
 $A = \frac{1}{4}\pi D^2$



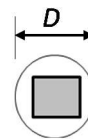
(b)
 $A = L \cdot D$



(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 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 classes of light sources

Energy efficiency class	Total mains efficacy η_{TM} (lm/W)
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 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.:

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

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

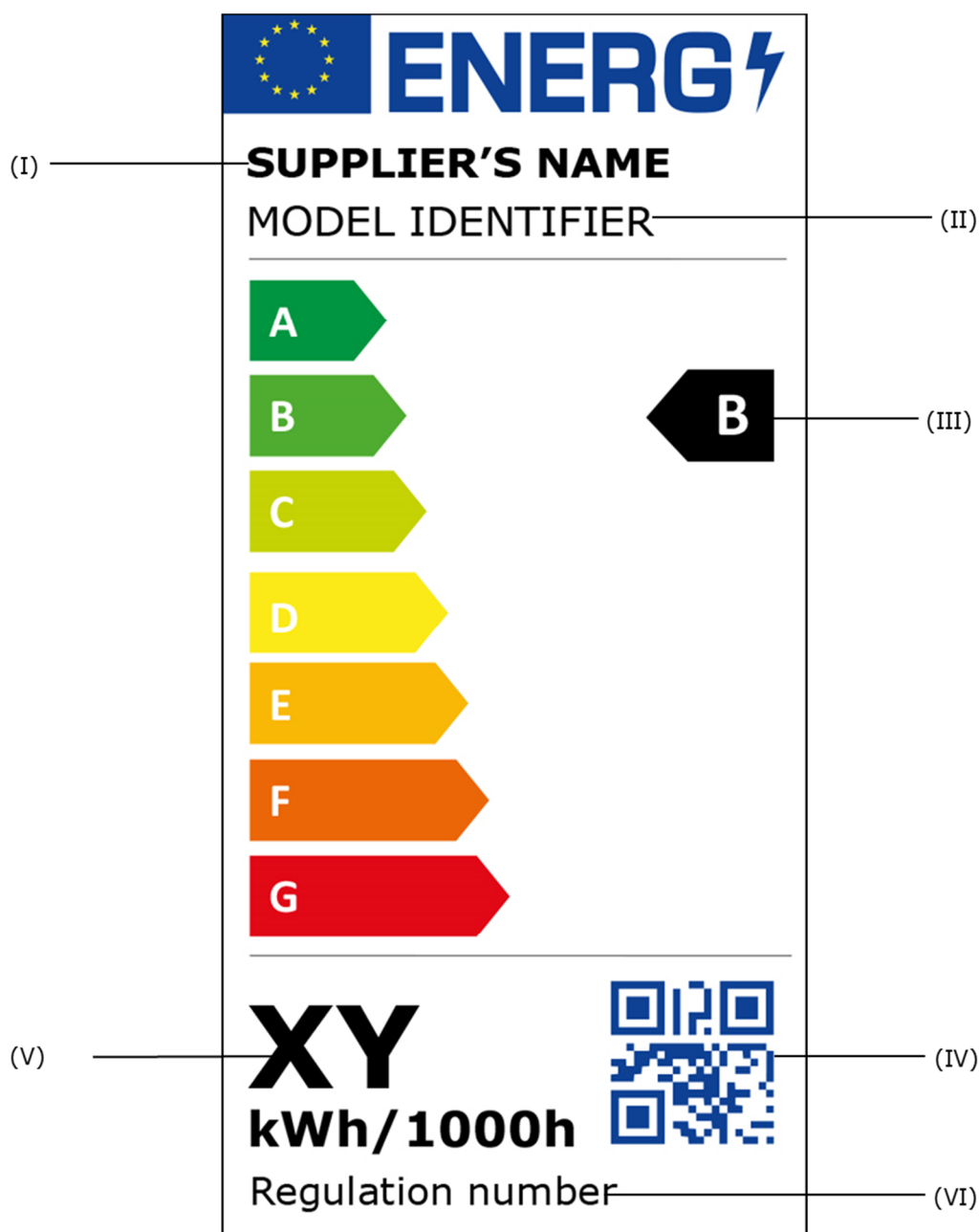
ANNEX III
Label for light sources

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.

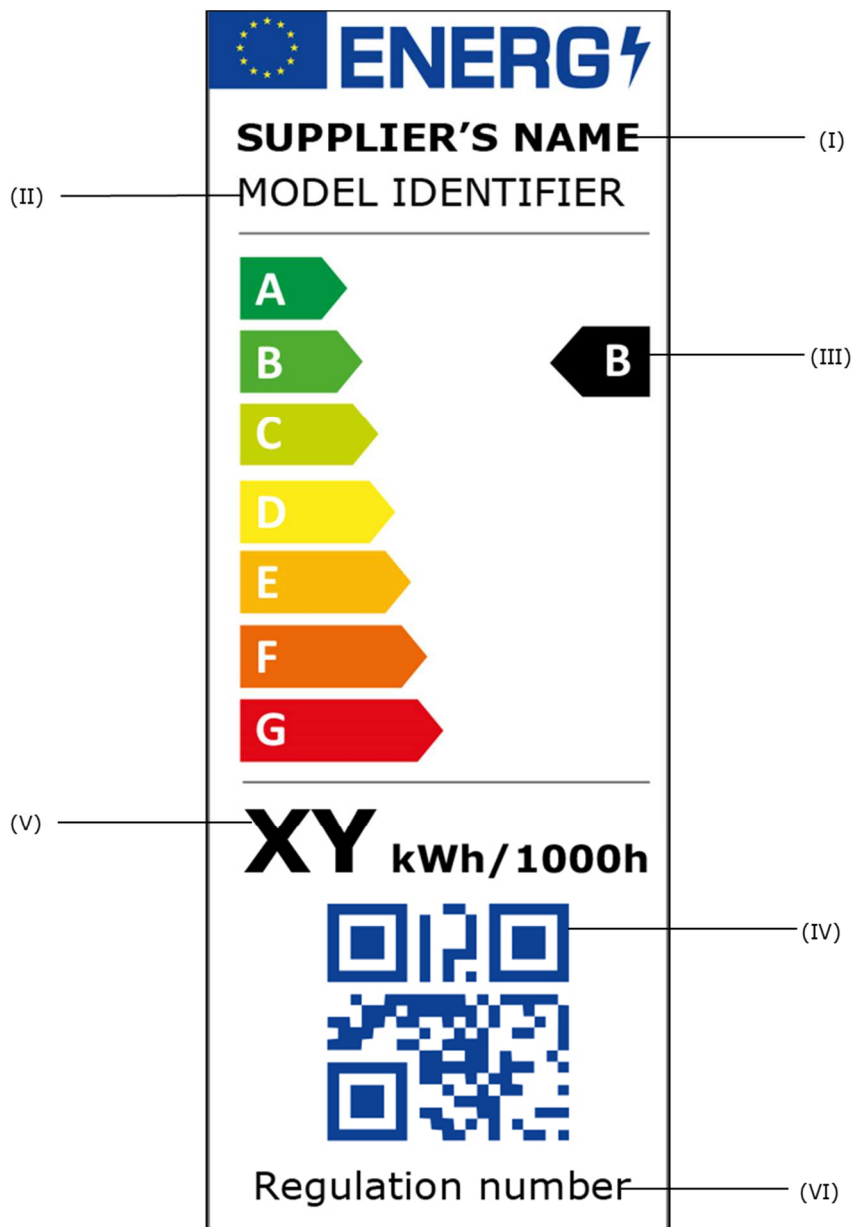
Suppliers shall choose a label format between point 1.1 and point 1.2 of this Annex.

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.

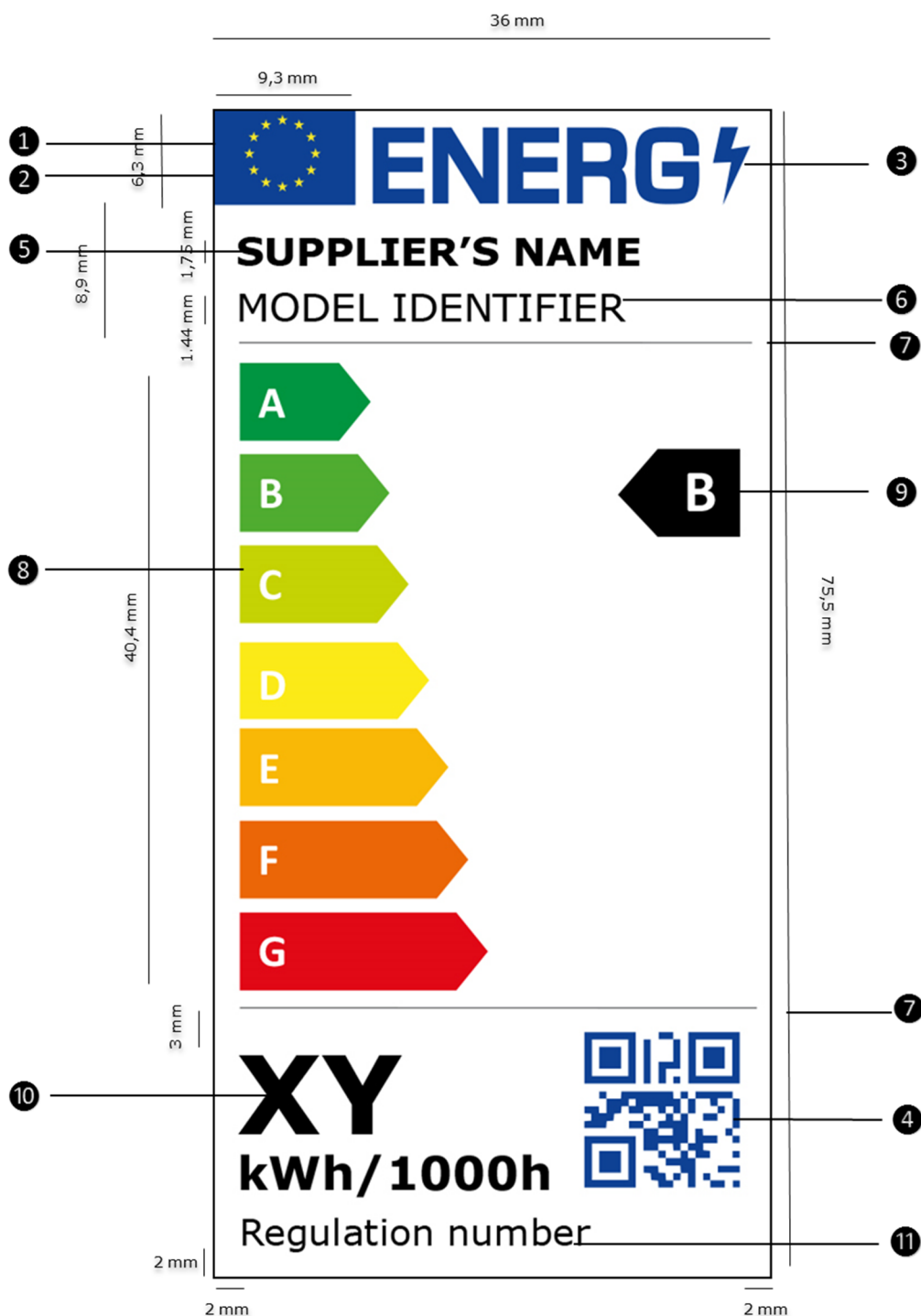
1.3. The following information shall be included in the label for light sources:

- 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]*.

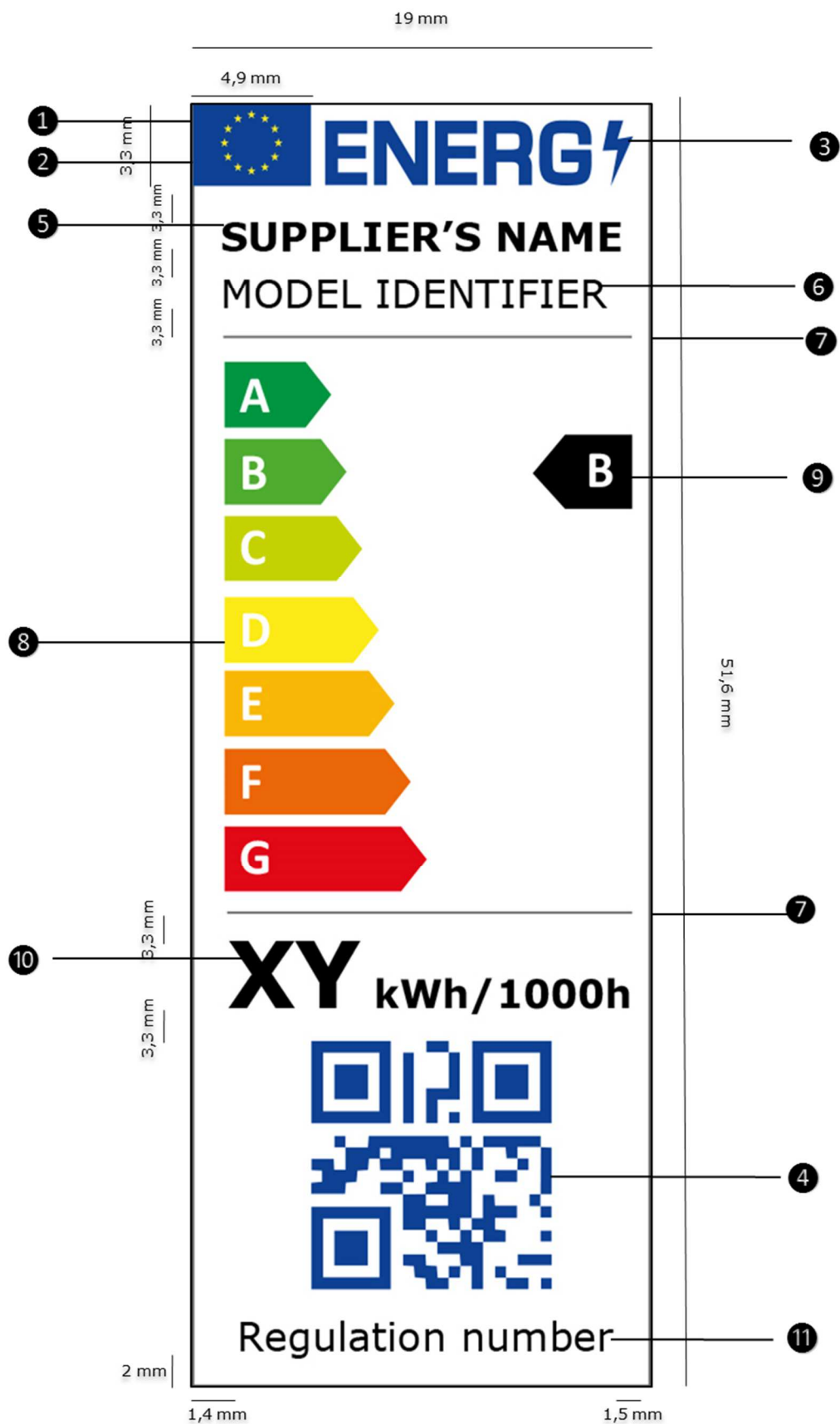
2. LABEL DESIGN

2.1. Standard label:



2.2. Label for small packaging:

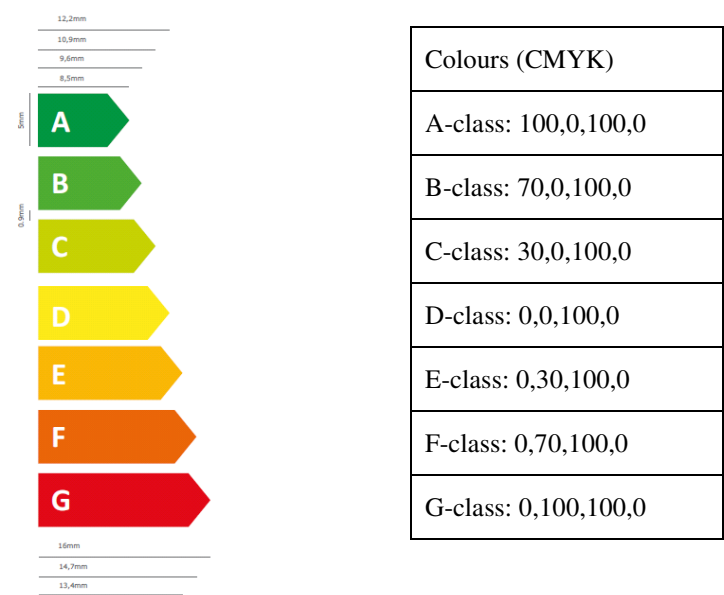
For small packaging, the label can be in the following format, for a part of the packaging which is not meant to face the prospective buyer:



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:



- (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)
	The arrow: 0-0-0-100

- (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 $L_{70}B_{50}$ 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.