Texte zu den geplanten neuen EU-Regelungen zur umweltgerechten Produktgestaltung und zur Energieverbrauchskennzeichnung in der Beleuchtung – Zusammenstellung * des Umweltbundesamtes (UBA), Deutschland

Entwürfe der EU-Kommission vom 13. November 2017

Stellungnahme Schwedens vom 2. Februar 2018

Hinweis: Bitte beachten Sie, daß der angehängte Text nur in Englisch verfaßt ist.

EN: Information on the coming EU Lighting Regulations – Ecodesign and Energy Labelling – Compilation * of the Federal Environment Agency (UBA), Germany

The EU Commission's drafts of 13 November 2017

Comments by Sweden, 2 February 2018

FR: Informations sur les futures réglementations de l'UE concernant l'éclairage – l'écoconception et l'étiquetage énergétique – Compilation * de l'Agence Fédérale de l'Environnement (UBA), Allemagne

Les projets de la Commission Européenne du 13 novembre 2017

Commentaires de la Suède du 2 février 2018

Indication: Veuillez noter que le présent texte n'est disponible qu'en anglais.

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

Inhaltsverzeichnis und Übersicht darüber, welche Themen der folgende Text behandelt und welche nicht

EN: → page IV

FR: → page VI

Erklärungen:

abc behandeltes Thema

abc nichtbehandeltes Thema

[1] T26LL = stabförmige (tubulare) Leuchtstofflampe mit einem Durchmesser von 26 mm (≙ 8/8 Zoll, daher auch die Bezeichnung T8)

EN: Content list and overview of the issues which are addressed in the following document and which are not

Explanations:

abc issue addressed

abc issue not addressed

2 T26FL = linear (tubular) fluorescent lamp with a diameter of 26 mm (≙ 8/8 inch; therefore also called T8)

FR: **Table des matières et un aperçu de quels thèmes sont traitées dans le texte ou ne sont pas**

Déclarations:

abc thème traité

abc thème non traité

[3] T26LF = lampe à tube fluorescent avec un diamètre de 26 mm (≙ 8/8 pouce ; et qu'on appelle donc aussi T8)

Es folgt ein unveränderter Originaltext.

EN: The following is an unmodified original text.

FR: Ce qui suit est un texte original.

Swedish Energy Agency

Date
2 February 2018

Energy Efficiency Department
Resource Efficient Products Unit

Christofer Silfvenius, Jonas Pettersson,
Carmen Butler and Peter Bennich
+46 16 544 22 78
peter.bennich@energimyndigheten.se

Orsola Mautone, DG Ener

Swedish comments on the draft regulations for Ecodesign and Energy labelling of Lighting

Introduction

SE welcomes these proposals for revised regulations on ecodesign and energy labelling for lighting. The focus of the comments is concentrated on technical aspects: however, when compared to our previous comments from September 2017 there are changes that reflects the new draft from the Commission as well as technical discussions with knowledgeable colleagues within and outside EU. The proposals presented here only represents the Swedish position, however.

Table of content

General Comments

Make it easier for the reader

In our experience, most stakeholders that need to study the regulations in detail (from manufacturers to retailers to procurers) have great difficulties in understanding the content, leading to unnecessary confusions and misinterpretations of the requirements. To address that, a few simple measures might be considered:

- Introduce a *Table of content*, right after the preambles. See *e.g.* EU 651/2014.
- Scope, exemptions and definitions: We recommend that only short descriptions with a focus on principles are places in the articles, whereas more detailed descriptions and/or lists, are placed in the annexes. Worst case is to have to read both articles and annexes to get a complete picture of *e.g.* definitions, as is the case now in the Commission draft.

Scope

Lower limit of the flux

Let the lower limit of the flux start at *30 lumen* rather than at 60 lumen; or alternatively, put a *power cap* on light sources with a flux between 30 to 60 lumen: Pmax ≤ 2 W.

The reason is that light sources of vintage type with a very low light output and efficacy is present on the market, sometimes with an efficacy as low as 3-4 lm/W. This means that a vintage lamp with a flux close to 60 lumen could use an electrical power of close to 20 W. (It should be noted that some manufacturers have asked specific questions regarding this limit to produce these kinds of lamps.)

Definitions

General

As said above, move all definitions to the Annexes.

Nominal, rated, declared and measured values

We propose to define all concepts in the Definitions, once and for all, and how to use them, for the benefit of manufacturers and MSA´s alike. A draft is given here:

Rated or nominal values: Indicative values given to “name” a product, to make it easier for consumers to distinguish between different products (or models). Typical used for parameters such as flux, colour temperature and lifetime, values often rounded. The rated or nominal values must nevertheless meet the measured values within the specified tolerances in Annex IV: Verification procedure.

Declared values: Precise values used to characterise the performance of the product, parameter by parameter. The declared values must meet the measured values, or calculated values using measured values, within the specified tolerances in Annex IV: Verification procedure.

Measured values: Precise values obtained by measurements according to harmonised test standards or, if no harmonised standards are available, best-practice test standards, and the procedures given in Annex IV: Verification procedure.

Ecodesign requirements

Phase out of T8 lamps

The proposed phase out of the main types of T8 lamps to 2020 will provide most of the part of the expected energy savings and reduced CO_2-emissions. Considering the remaining CO_2-budget is shrinking fast, any delay *cannot be taken lightly*.

Some stakeholders, ignoring analyses of the overall societal impact and cost of a delay, have argued that a phase out of the main types of T8 light sources are premature, referring to high purchase price and LCC, and/or poor technical and lighting performance of either retrofit LED light sources or completely new LED-based luminaires.

SE have checked these arguments with several stakeholders that either already have replaced the T8 (or T5) light sources or plan to do so soon, and find that these stakeholders have come to another conclusion. Experiences from real installations prove the existing alternatives, including retrofit LED tubes (with safe solutions for the electrical installations), to be clearly satisfying or superior both from a technical (lifetime, maintenance, etc) and lighting (light distribution, glare, colour temperature, safety, comfort, esthetical, etc) point of view. Even when it comes to the LCC, existing alternatives are many times already attractive.

Thus, given the observed speed of market transformation, we believe that reduction in price and improvement of performance will continue so that in time for 2020, the market will provide a flora of even more attractive LED-solutions in terms of both price and performance.

Flicker

With the introduction of LED-based light sources, the problem with flicker, once solved for fluorescent light sources, has returned. For this reason, we strongly believe limits must be established in the eco-design regulations (if not in other regulations), or else there is a significant risk for a backlash of the acceptance of LED-based light sources.

Test standards for both the short-term flicker (PstLM), IEC TR 61547-1, and for stroboscopic flicker (SVM), IEC TR 63158 (to be published in August 2018), are available; thus, SE not only supports the proposal for LED and OLED MLS with

a requirement on Pst ≤ 1 (full load) but want to *add* requirements on stroboscopic flicker by setting SVM ≤ 1.6.

Power factor

In previous comments, SE have argued to use the displacement factor (DF) instead of the Power factor (PF) to treat requirements on the relative amount of reactive power a driver may inject in/draw from the electric grid. However, after discussions with other lighting laboratories it seems like this would require adjustments in the way the laboratory setup is characterised, something that is perceived as a burden, *why we propose to go back to requirements expressed as a PF in table 4 of the ED Annex*. This is also reflected in the tolerances in table 6, which is expressed in terms of PF (see the next section).

Table 4: Functional requirements for light sources

Colour rendering	CRI ≥ 80 Ra (except for HID with Φ_{use} > 4 klm and for light sources intended for use in outdoor applications, industrial applications or other applications where lighting standards allow a CRI<80, when a clear indication to this effect is shown on the light source packaging and in all relevant printed and electronic documentation)
Power factor at power input P for LED and OLED MLS	No limit at P ≤ 2W, PF ≥ 0.4 at 2W < P ≤ 5W, PF ≥ 0.7 at 5W < P ≤ 25W, PF ≥ 0.9 at 25W < P
Functionality after accelerated endurance testing for LED and OLED	As specified in Annex V
Colour consistency for LED and OLED light sources	Variation of chromaticity coordinates within a six-step MacAdam ellipse or less.
Flicker for LED and OLED MLS	Pst LM ≤ 1.0 at full-load SVM ≤ 1.6

Verification procedure

SE have discussed the tolerances extensively with other lighting laboratories both within and outside of EU. As a result, some adjustments are proposed as compared to our previous suggestion from 2017 (which was partly used in the draft from the Commission).

One adjustment concerns the on-mode power: the power factor and the tolerances of the active power are linked, why we propose to introduce an interval between 5 W and 25 W (i.e. not only have one interval ranging from 5 W to 100 W), reflecting the intervals used for the requirements on power factor in table 4. Furthermore, the tolerance expressed for the PF is changed to absolute values

rather than in per cent. (See the previous section regarding going back to the power factor rather than the displacement factor.)

Furthermore, in table 6, we have removed some parameters for the following reasons:

- **Control gear efficiency [*%*]:** Pin and Pout are measured individually, with tolerances already specified.
- **Lumen Maintenance Factor:** The flux already has a tolerance specified.
- **Survival factor:** No need for a tolerance; see the comments life/endurance tests.
- **$M_{70}F_{50}$ lifetime (for LED and OLED):** This is actually a requirement, not a tolerance.

Table 6: Verification tolerances

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 %.
Power 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 be less than the declared value minus 10 %.
	10	The determined value shall not be less than the declared value minus 5 %.
No-load power P_{no}, Standby power P_{sb} and Networked standby power P_{net} [*W*]	3	The determined value shall not exceed the declared value by more than 0.10 W.
	10	The determined value shall not exceed the declared value by more than 0.10 W.

CRI [*0-100*]	3	The determined value shall not deviate from the declared value by more than 3.
	10	The determined value shall not deviate from the declared value by more than 2.
Flicker [*Pst LM*]	3	The determined value shall not exceed the declared value by more than 10 %.
	10	The determined value shall not exceed the declared value by more than 10 %.
Flicker [*VSM*]	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.
	10	The determined number of steps shall not exceed the declared number of steps.
Luminous intensity [*cd*]	3	The determined value shall not deviate from the declared value by more than 10 %.
	10	The determined value shall not deviate from the declared value by more than 5 %.
Beam angle (*degrees*)	3	The determined value shall not deviate from the declared value by more than 25%
	10	The determined value shall not deviate from the declared value by more than 25 %.

Removal of light sources and separate control gears

SE welcomes this proposal in principle as it sends a strong signal to all actors in the value chain to consider reparability, upgradeability and easier recycling and/or end-of-life management, all key factors in a resource efficient economy.

Whether there are containing products, such as fully integrated products or smaller products aimed mainly for decorative lighting (although still in scope), that could have less strict requirements or even be exempted, can be explored further.

Life and Functionality after accelerated endurance testing

SE believes that requirements on life time are important since the quality of lighting products still varies. Thus, SE asks the Commission to keep (and adjust, if deemed necessary) the requirements of lumen maintenance and rated lamp life/lamp survival factor expressed in the *current* set of regulations, for all technologies in scope of the *new* regulation.

Regarding LED and OLED, we propose the following methods, summarised in the table below.

As a default, we propose to keep the possibility to test all products as before, i.e. in continuous on-mode for 6000 h, in combination with requirements on the

lumen maintenance and lamp survival factor. Together with LM80-data, claims on declared life time can be verified as well.

Furthermore, it is still desired to establish a harmonised test standard for endurance tests using a time less than 6000 h. Since no such test method exists yet, SE proposes a transitional method in the meantime. Based on various experiences from different test labs, and, not least, investigations by the Lighting Research Center (in Troy, NY State), rather slow switching cycles to and from an elevated temperature have shown to stress the light sources in such a way that poor products are revealed quite effectively. However, as it seems like climate chambers (temperature boxes) are not the typical equipment for lighting laboratories, we here suggest a transitional method with slow switching cycles in ambient room temperature (as specified for the other tests). It can be applied to light sources as well as light engines, LED modules and containing products.

To allow for as close to equilibrium conditions as possible in *on* and *off* mode, respectively, we furthermore differentiate between low and high mass products; thus, for low mass products, i.e. with a weight < 1 kg, the switching pattern is 40 min *on*, 20 min *off*. For high mass products, i.e. with a weight > 1 kg, we propose a switching pattern of 3 h *on*, 1 h *off*. (It can take several hours for a large product to reach equilibrium.) In both cases, we stick to 3000 h, meaning that the actual number of cycles will be different (3000 cycles for a low mass product; 750 cycles for a high mass product.)

For both methods, a product will pass if the requirements of both the lumen maintenance *and* population survival factor are met.

Finally, we propose to stick to the number of samples stated in the Commission draft; either 10 for "cheap" or 3 for "expensive" products. Concerns have been expressed that the proposed limit of 500 Euro (for the total cost of 10 products) is too high, why SE proposes to consider lowering the limit to 250 Euro.

The two methods are summarised in the table below.

Table: Test methods for life/endurance for LED and OLED

Test method	**Samples** *Minimum number*	**Lumen maintenance (%)** *Per individual object*	**Population survival factor:** *"Survival" = pass on the lumen maintenance requirement*
Method 1: 6000 h *Continuously on*	3	80 %	100 %
	10	80 %	90 %
Method 2: 3000 h *Switching cycles:*	3	90 %	100 %
	10	90 %	90%

- 40 min on and 20 min off for low mass products (< 1 kg) - 3 h on and 1 h off for high mass products (≥ 1 kg)			