

Consultation Questionnaire Exemption No. 5b

Exemption for „Lead in glass of fluorescent tubes not exceeding 0,2 % by weight“

Abbreviations and Definitions

CFL	Compact Fluorescent Lamps
EEE	Electrical and Electronic Equipment
LE	LightingEurope
LFL	Linear Fluorescent Lamps
TLED	It is assumed that TLED means LED tubes – this is not specified by LE
Pb	Lead
RoHS	Directive 2011/65/EU on the Restriction of Hazardous Substances in Electrical and Electronic Equipment
wt %	Weight percent

Background

The Oeko-Institut has been appointed by the European Commission, within a framework contract¹, for the evaluation of applications for exemption from Directive 2011/65/EU (RoHS), to be listed in Annexes III and IV of the Directive.

LightingEurope has submitted a request for the renewal of the above-mentioned exemption, which has been subject to an initial evaluation. A summary of the main argumentation for justifying the request is provided below. The applicant has been requested to answer additional questions and to provide additional information, available on the request webpage of the stakeholder consultation (<http://rohs.exemptions.oeko.info/index.php?id=363>).

For further details, please check the applicant's exemption request under the link available above.

The objective of this consultation and the review process is to collect and to evaluate information and evidence according to the criteria listed in Art. 5 (1) (a) of Directive 2011/65/EU (RoHS 2), which can be found under:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32011L0065:EN:NOT>

If you intend to contribute to the stakeholder consultation, please read the summary of the argumentation provided and answer the questions that follow.

¹ The contract is implemented through Framework Contract No. ENV.B.3/FRA/2019/0017, led by Ramboll Deutschland GmbH.

1. Summary of argumentation of applicant on the justification of the exemption

1.1. Background

The current Formulation of exemption 5(b) in Annex III of the RoHS Directive is:

“Lead in glass of fluorescent tubes not exceeding 0,2 % by weight”

In 2015-2016, Oeko-Institut performed an assessment of exemption 5(b), initiated through the submission of a request for the renewal of the exemption by LightingEurope. The study (Gensch et al. 2016) recommended the renewal of this exemption for five years until 21 July 2021, with the same wording:

“Lead in glass of fluorescent tubes not exceeding 0,2 % by weight”

The revision of Annex III in relation to this exemption is still pending.

In January 2020, LightingEurope (2020) submitted a new application for the renewal of this exemption. LightingEurope requests the renewal of Ex. 5(b) for an additional 5 years, but proposes the following wording, with a view to extending the scope of the exemption:

*“Lead in glass of fluorescent tubes **and LED retrofit tubes (glass in lighting equipment)** not exceeding 0.2 % by weight”.*

1.1.1. Scope of the requested amendment

LightingEurope (2021) was asked to clarify for what equipment the extension of scope of the exemption is required. In this regard, LightingEurope states that the term “lighting equipment” of Annex I of the RoHS Directive covers products falling in Category 5. LightingEurope requests the exemption for lamps used in Category 5 EEE e.g. luminaires. “The exemption is intended for products and components (e.g. lamps) using soda lime glass as a material, using during the production process a fraction of recycled glass stream on top of virgin minerals”. LightingEurope considers the following lighting equipment, where lead is not intentionally added, to be included:

- Glass in LED lamps where recycled glass can be used to increase resource efficiency;
- Glass in luminaires containing fixed installed LED modules, replacing luminaires for fluorescent lamps, where recycled glass can be used to increase resource efficiency.

According to LightingEurope (2021), glass is used as a functional or decorative material in many luminaires, irrespective whether it is used stand-alone (Cat. 5) or as part of a Cat 1-11 products, e.g. in a kitchen hood.

1.1.2. Volume of lead to be placed on the EU market through the exemption

To estimate the amount of Pb to be placed on the EU market through this exemption, LightingEurope (2020) assumes an average Pb content of 500 ppm resulting from the recycled glass of old lamps. In 2022, 150 million fluorescent lamps will be placed on the EU-28 market per annum and about 50 million LED replacement lamps², with an average weight of 0.1 kg per lamp, of which the glass accounts for ca. 75 wt % (weight percent) per lamp “= 50.000 tons; hereof 0.05/0.2% lead”. It is roughly estimated that 8 tons of lead would enter the EU-28 market bound in lamp glass with 30 tons

² LightingEurope (2020) reference the VHK 2018 MELISA Model for this data.

being the worst case, assuming all lamp glass would contain 0.2% lead (which is stated to be an unrealistic assumption).

1.2. Technical description

LightingEurope (2020) explains that lead (Pb) was used in the past for functional reasons in the production of glass for fluorescent tubes, and was contained in the glass at a concentration of up to 20%. Leaded glass is explained to have been easier to process in all steps of glass smelting and glass soldering, leading to lower failure amounts in the manufacture of fluorescent tubes. Pb, however, was successfully phased out and is no longer needed for functional purposes. Nonetheless, despite not being intentionally added, Pb is still present in the glass of fluorescent tubes due to the use of secondary glass recovered from the waste management of fluorescent tubes in the manufacture of new tubes. As this glass can contain differing amounts of Pb, a maximum content of 0.2 wt % Pb can be contained in the glass of fluorescent or LED retrofit tubes, though from internal measurements, most lamps do not exceed the threshold of 0.1 wt % in glass.

1.3. Applicant's justification for the requested exemption

LightingEurope (2020) state that fluorescent lamps and LED retrofit tubes have a long lifetime. Seeing as lead in glass of fluorescent tubes was allowed in the EU until 2010 and is still allowed in most countries outside the EU (e.g. in China), lead-containing recycled glass can be expected to be available for the foreseeable long term, probably decades. Lead in the glass is said to be safe, as it will not leave the glass matrix under any circumstances.

1.3.1. Availability of alternatives

It can be understood that newly manufactured glass could be used as a substitute and would not have reliability limitations. The main argumentation is based on the environmental benefit of using recycled glass, resulting in the placing of Pb on the EU market through lamp glass.

1.3.2. Environmental and health arguments

According to LightingEurope (2020) the main justification for the exemption is that the use of recycled glass reduces the energy consumption required for glass production significantly, as the recycled glass amount needs up to 30% less energy for manufacture. Typically, in a glass production plant, 30 - 40 % recycled glass is used, whereas technically up to 80% is estimated to be possible. However, such high amounts require the recycled glass be nearly identical to the produced glass. Thus, the main source for the recycled glass is mainly glass from lamp recycling. The lead content (as well as mercury content) is measured regularly in the glass production plant.

LightingEurope (2020) expects a large amount of fluorescent lighting installations to be replaced in the coming years in light of the transition to LED installations. This might lead to a temporary increase in the Pb content in recycled glass. The exemption is to allow the use of glass recovered from these installations to be used in the manufacture of special purpose fluorescent lamps or for glass tubes for TLEDs. LightingEurope express concern that the denial of the exemption could lead to the limitation of the use of recycled glass for lamp glass production and thus to wasted glass, as well as to higher costs for ongoing product conformity assessments.

LightingEurope (2021) believes the exemption is important to fulfil increasing EU requirements for the use of recycled materials in new products, in the production process of glass added as a fraction to the virgin minerals stream, as well as to reduce energy consumption in glass production.

Regarding the handling of lamps (and lamp glass) at end-of-life, LightingEurope (2021) explains that *“depending on the system in place in the different EU countries, lamps are either collected and handled in the same waste stream or in other countries, there is a separation. During treatment fluorescent lamps are usually separated from LED lamps especially LED lamps containing plastic tubes and covers. Whether the glass fractions are separated depends on the recycling technology applied. Irrespective of the process:*

- *The same glass tubes, consisting of a fraction of recycling materials are used for new fluorescent lamps, as well as for LED lamp glass;*
- *Most LED lamps are produced outside the EU. In the production countries, the ban of lead in lamp glass was introduced later or is not yet in force. Recycled glass batches containing lead are used in the production of lamp glass in those countries and added as a fraction to the virgin minerals stream in a furnace, increasing the risk of lead content levels in final glass tubes. The exemption is necessary to avoid the unnecessary scrapping of products in accordance with circular economy principles”.*

2. Questions for stakeholders

1. The applicant has requested an exemption, proposing the following wording formulation: *“Lead in glass of fluorescent tubes and LED retrofit tubes (glass in lighting equipment) not exceeding 0.2 % by weight”* as opposed to the current wording *“Lead in glass of fluorescent tubes not exceeding 0.2 % by weight”*
 - a. Do you agree with the scope of the exemption as proposed by the applicant?
 - b. Please suggest an alternative wording and explain your proposal, if you do not agree with the proposed exemption wording.
 - c. Please explain why you either support the applicant’s request or object to it. To support your views, please provide detailed technical argumentation / evidence in line with the criteria in Art. 5(1)(a) to support your statement.
2. LightingEurope (2021) states that *“With regard to “lead in glass of fluorescent tubes and LED retrofit tubes (glass in lighting equipment)”, to the knowledge of LightingEurope, only soda lime glass is used”*. Do you agree with the limitation of the exemption scope to soda lime glass? Please explain your view.
3. Please provide information concerning possible developments that may enable reduction at present or in the future, of *“lead in lamp glass”*;
 - a. In this respect, please explain if and how the amount of lead in lamp glass is expected to change over the next 10 years.
 - b. Please provide quantitative data as to application specifications to support your view.
4. Please provide any further information and/or data that you think is of importance to substantiate your views.

In case parts of your contribution are confidential, please provide your contribution in two versions (public /confidential). Please also note, however, that requested exemptions cannot be granted based on confidential information!

Finally, please do not forget to provide your contact details (Name, Organisation, e-mail and phone number) so that Oeko-Institut can contact you in case there are questions concerning your contribution.

3. References

- Gensch, C.-O.; Baron, Y.; Blepp, M.; Moch, K.; Moritz, S. (2016): Study to assess renewal requests for 29 RoHS 2 Annex III exemptions [no. 1(a to e - lighting purpose), no. 1(f - special purpose), no. 2(a), no. 2(b)(3), no. 2(b)(4), no. 3, no. 4(a), no. 4(b), no. 4(c), no. 4(e), no. 4(f), no. 5(b), no. 6(a), no. 6(b), no. 6(c), no. 7(a), no. 7(c) - I, no. 7(c) - II, no. 7(c) - IV, no. 8(b), no. 9, no. 15, no. 18b, no. 21, no. 24, no. 29, no. 32, no. 34, no. 37] - Pack 9.
<http://rohs.exemptions.oeko.info/>. In collaboration with Deubzer, O. and Gibbs, A., 2016.
- LightingEurope (2020): Request to renew Exemption 5(b) under Annex III of the RoHS Directive 2011/65/EU, Lead in glass of fluorescent tubes not exceeding 0.2 % by weight. LightingEurope (ed.), 16 Jan 2020.
- LightingEurope (2021): Answer to clarification questions regarding Ex. 5b of Annex III. LightingEurope (ed.), 15 Mar 2021.