

1st Questionnaire Exemption No. 21 (renewal request)

Exemption for „Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses“

Abbreviations and Definitions

Cd	Cadmium
LEU	Lighting Europe
Pb	Lead

Background

The Oeko-Institut and Fraunhofer IZM have been appointed within a framework contract¹ for the evaluation of applications for the renewal of exemptions currently listed in Annexes III of the new RoHS Directive 2011/65/EU (RoHS 2) by the European Commission.¹

Lighting Europe (LEU) has submitted a request for the renewal of the above mentioned exemption, which has been subject to a first evaluation. The information you have referred has been reviewed and as a result we have identified that there is some information missing and have formulated a few questions to clarify some aspects concerning your request.

Questions

1. The application was submitted by LEU and a contact person from the association is named, however within the document Philips Lighting is referred to as submitter of the application. Please clarify the reference to Philips Lighting and whether the exemption is needed by other manufacturers aside from Philips Lighting.

Answer LEU: *Paper has been submitted by Lighting Europe so on behalf of the European Lighting industry.*

2. It is stated that “The lead free ink solutions have been found, but they cannot be effectively utilized in all situations with the required mark quality.” Later in the document in a number of places, lamp types for which the exemption is needed are detailed, however referring in different instances to different lamp types (see lists on page 4 and on page 5).
 - a. Please provide an exhaustive list of lamp types for which the exemption is still needed.

Answer LEU: *Request concerns (non-) linear fluorescent lamps (e.g. T5, T8, T12), high pressure sodium lamps, ceramic metal halide lamps, quartz metal halide lamps, PAR*

¹ Contract is implemented through Framework Contract No. ENV.C.2/FRA/2011/0020 led by Eunomia

lamps, incandescent lamps for special purposes (exempted from 244/2009), halogen lamps (low and mains voltage) in general for those lamps where lamp stamp is located on the glass material (e.g. tube or bulb).

- b. Please comment as to the various lamp types, if some or all are in the process of phase-out in light of their replacement with other lamp types for which the exemption is not required (i.e., through transition to other technologies, change in future design etc.)

Answer LEU: *Those lamps are still required on the market and are not in the process of phase out.*

- c. If only a sub-group of a lamp type is relevant for the questions above, please specify. For example, fluorescent lamps are mentioned however in some fluorescent lamps the marking is not made on the glass as in the example below.

Answer LEU: *Provided example concerns compact fluorescent lamps, however indicated in the exemption renewal the request concerns among others linear fluorescent lamps. On these lamps the stamp cannot be located on other materials than the glass.*



Source: Oeko-Institut 2015

3. Please explain what properties of lead in the relevant inks are important for ensuring the quality of the marking and its durability.

Answer LEU: *Lead is one of the components in the low melting glass (enamel) which is in its turn a component in the ink. This enamel has a very low softening point due to the presence of lead, which is needed to adhere the pigment particles in the ink to the bulb glass of the lamp, without affecting the lamp bulb glass itself, during the fixation process of the marking to the lamp bulb glass at elevated temperatures. Furthermore it ensures that the marking will last on the lamp during life time of the lamp.*

LightingEurope is of the opinion that the question whether glass marked with pigment particles embedded in enamel is considered as homogeneous material is not resolved completely. Hence, since the marking cannot be removed by mechanical abrasive means LightingEurope considers the marked glass as homogenous material. This was the position of ELC some

years ago when the exemption was extended from borosilicate glass to all type of (lamp) glasses. This exemption gave legal certainty to manufacturers, supply chain and authorities.

4. Please explain the basis for applying the mark on the glass of such lamps and whether the need for this exemption could not be eliminated on the basis of applying the marking to other components of the application? Assuming that the application of the marking is a result of safety standards, please provide reference to the relevant documents as well as a citing the relevant text excerpts so that the requirements can be derived (application area; durability etc.).

Answer LEU: *The marking has several functions, during entire life cycle²:*

- *to identify the producer (a.o. brand and Made in ...),*
- *to identify lamp type and wattage, which is relevant for safety, correct lamp replacement and recycling,*
- *CE, WEEE marking.*

Product identification is legally required for CE Marking according to the LVD Directive (2006/95/EC). A list of harmonized standards falling under this directive is published in OJEU as 2015/C 125/02. For instance, the marking requirement for linear fluorescent lamps is given in safety standard EN61195 in clause 2.2.1 (citing relevant text excerpts infringes with copyright of the standards, hence they are not provided in the answer). Moreover, marking of lamps at the end of life is also required by the WEEE Directive (2002/96/EC).

5. Please clarify on what technical basis alternative inks or marking methods such as engraving (possibly on alternative marking areas, e.g. not the lamp glass) cannot be applied on the lamps for which the exemption is needed. In your response please also explain:
- a. Why substitutes could be used in some cases but not in others as can be followed from the formulation "...cannot be effectively utilized in all situations".
 - b. If there certain use conditions (temperature, service life, etc.) that affect the applicability of substitutes on some lamp types, making substitution a problem in some cases but not in others?

Answer LEU: *Marking the glass with etching/engraving does not seem to be technically feasible due to cracks.*

As indicated in answer for question 4 marking of lamps must fulfil criteria set by standards and regulations, among others related to safety directive, WEEE and information essential for lamp identification must be visible during the entire service life. For example on straight fluorescent lamps, the lamp glass is the only place where this labelling on the product itself is possible, due to limited space and regulated size on marking on any other visible component such as lamp base (cap).

Product identification must be legible for the consumer or other stakeholders during the entire life cycle of the product (safety, replacement, recycling etc.). Intensive heat and light during lamp operations result in quality challenges for the marking of a lamp. Some luminaries, state

² Final OEKO Report 2007-10 (see chapter 5.4, document page 50)

a maximum wattage in order to avoid excessive heat. If a mark is not properly legible for the user, the user might place the wrong lamp into a luminaire with the consequence of a high safety risk. Maximum lamp temperatures may differ per lamp type and application. For example, clause 2.9.1 in EN61195 for linear fluorescent lamps states that maximum cap temperature rise can vary from 55 to 95K depending on the specific product type.

It also has to be considered that a lamp can be used for a certain period of time, exchanged against another lamp in an existing application but still not at end of life. If this lamp is used again, packaging and other product description are no longer available, hence general product designations are important to be present on the lamp.

6. Please clarify the following statements or provide data to clarify the calculations made to provide these estimations:
 - a. “Total amount of lead on the stamp in TL: approximately 2 kg lead” – what does TL stand for in this case? Does the quantity refer to all lamps of this type placed on the EU market? What is the reference for this quantity; please also refer to the number of lamps, of the relevant kind, estimated to be placed on the EU market per year?

 - “Total amount of lead in HID lamps and Par lamps in Europe is less than 0.5 kg” - What is the reference for this quantity; please also refer to the number of lamps, of the relevant kind, estimated to be placed on the EU market per year.

 - b. “All lamps above mentioned: the amount of lead is very low, of lesser interest” – what lamps does this statement refer to – lamps not mentioned in a. and b.? Please clarify.

 - c. Please provide a total estimation for the amount of lead placed on the EU market per annum through the use in marking inks allowed through exemption 21. Please provide a reference for this number in terms of the estimated amount of lamps that this number correlates to.

Answer LEU: *The answer is addressing points (a), (b) and (c). In the Öko evaluation in 2009 the amount of lead put on the market was reported to be 100 kg. The implied reduction of almost a factor of 50 as indicated in the renewal request is too good to believe. This is indeed the case: the calculation contained an error and the amount should not be 2 kg but 20 kg lead for linear fluorescent, the amount of 0.5 kg for HID and PAR lamps is correct. This amount is calculated by multiplying the volumes of lamps with lead containing marking with the estimated average amount of lead used per stamp (depending on mark size and text). The detailed calculations are not provided in this document to prevent infringement of the competition law.*

The relevant lamp types are indicated in the answer to question 2.a

7. Please clarify why LEU applies for the original formulation of exemption 21, when the provided information indicates that only part of the scope of this exemption is relevant for lamp applications addressed in the request:
 - a. Could the scope of the exemption be adapted to address only such relevant applications? If so, please provide a proposal for an alternative formulation

Answer LEU: Yes, the exemption can be limited to the use of Lead in ink, hence LightingEurope proposes new exemption formulation as follows: “Lead in printing inks for the application of enamels on glasses”

- b. The provided argumentation does not mention the need for Cd in inks used for marking lamps. Please clarify if and on what basis the continuation of the exemption for the use of Cd in such inks is justified?

Answer LEU: To the best knowledge of LightingEurope Cd in ink is not used anymore, hence this part of the exemption can be stopped.

- c. Please clarify if the lead based inks are in use for marking lamps on both borosilicate and soda lime glass surfaces or only on the latter. Please clarify if and on what basis the continuation of the exemption for the use of the various inks on borosilicate is justified, despite the fact that no specific reference has been made to such glass in reference to lamps.

Answer LEU: The exemption is relevant for both mentioned types of glass, i.e. borosilicate and soda lime glass and also quartz glass.

8. In section 6.2.3 you refer to expected economic impacts of substitution. Please provide an estimation for the range of the impacts mentioned as well as detail as to the actual impacts expected. For example, what is the expected difference in fixed cost expected? Is this difference expected as a one-time investment or as a running annual cost difference of manufacture? What possible social impacts are expected?

Answer LEU: The impact on fixed costs is related to development needs and consequently possible changes to production equipment and processes. The social impact however is related to potential job losses unless proper alternatives cannot be secured and exemption (at the same time) is not granted. The financial aspects of this impact are not provided in this paper, to prevent infringement of the competition law.

9. In section 8 it is stated that the reduction of lead is partly possible, referring to earlier chapters, however detail of possible reduction was not provided. Please elaborate in what sense reduction is possible.

Answer LEU: The LightingEurope answer provided in chapter 8 meant the elimination of Lead in printing inks in selected lamps (hence referred to “is partly possible”).

Please note that answers to these questions are to be published as part of the available information relevant for the stakeholder consultation to be carried out as part of the evaluation of this request. If your answers contain confidential information, please provide a version that can be made public along with a confidential version, in which proprietary information is clearly marked.