1st Questionnaire Exemption No. 5(b) (renewal request)

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

Abbreviations and Definitions

EoL	End of life
LEU	LightingEurope
Pb	Lead

Background

The Oeko-Institut and Fraunhofer IZM have been appointed within a framework contract[1] 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]

LightingEurope (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 mentions that ”*Different glass parts in a lamp such as tube or flare are considered by LightingEurope as different homogenous materials*.” Please provide clarification for example such as a schematic drawing of the lamp to clarify for stakeholders the location and nature of the different components of the lamp mentioned in this statement.

Answer LightingEurope: During lamp manufacturing, the glass bulb is assembled from several different glass components which are connected together by localized melting/fusing. These components themselves can be made from glass coming from different glass ovens, and therefore can have different compositions. Typically these components are: (1) the glass tube that encapsulates the gas discharge, and for the electrode region the combination of (2) the so-called flare and (3) exhaust tube (see Figure 1). A lamp is made in subsequent steps where the individual components are connected together. First, a so-called stem is made (from the flare and exhaust tube). On the stem the coil/electrode is mounted and an electrode shield can be positioned (see Figure 2). In next processing steps these stems are connected with the lamp tube (see Figure 3).

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

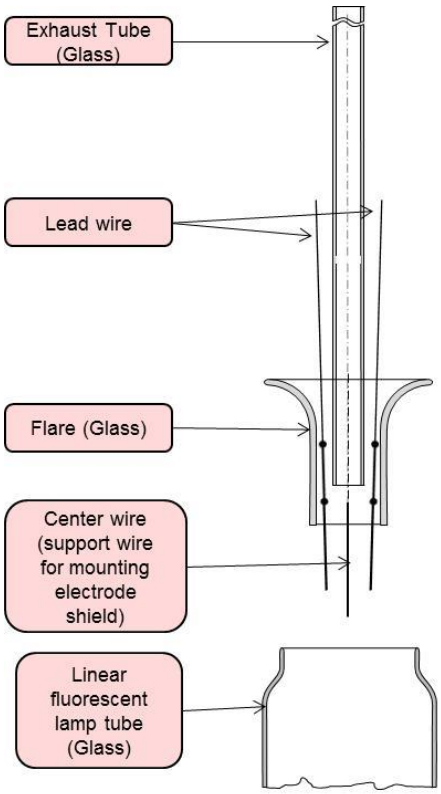

Figure 1 Components of a linear fluorescent lamp (lead wire = Pb-free wire to transfer power)

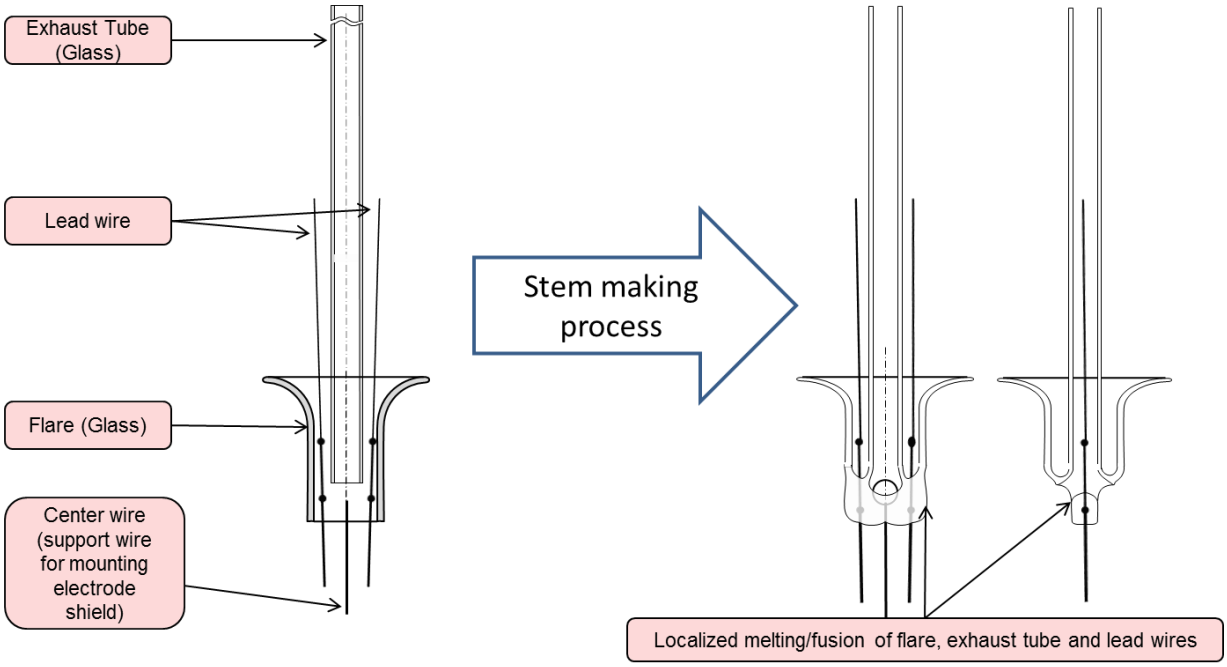

Figure 2 Stem making for a linear fluorescent lamp

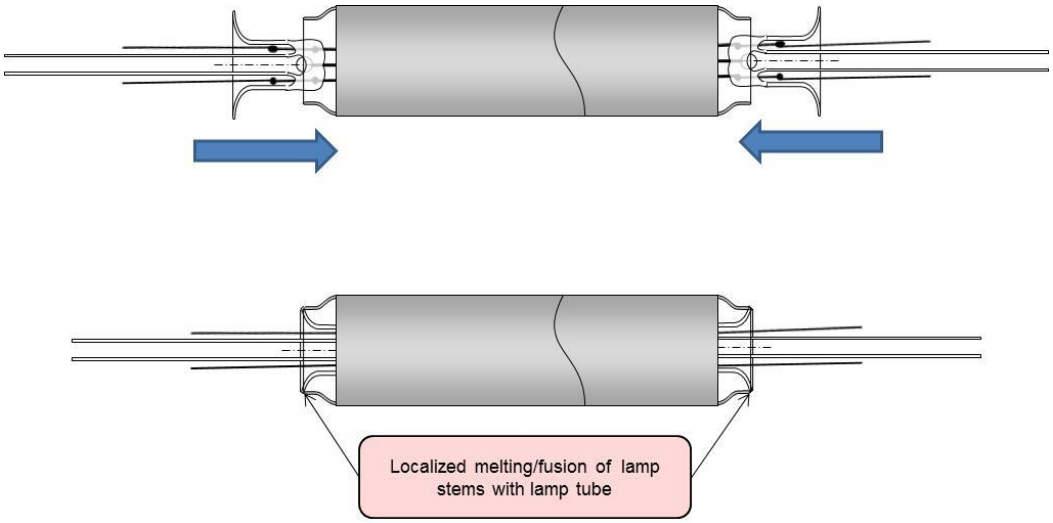

Figure 3 Lamp-Stem assembly for a linear fluorescent lamp

Traditionally, Lead containing glass was used for the flare in the stems of lamps as this is the area where the electrical connection (feed-through) is made and high requirements are set on the glass properties with respect to (matched) thermal expansion with the metal lead wires; respectively for the electrical and chemical resistance of the glass itself. Next to this, for the tube glass of higher loaded lamps Lead-containing glass was also used in view of its better electrical and chemical stability versus other soda-lime glasses.

2. An estimation is provided regarding the amount of lead to enter the EU per year through this application.
    a. Can you make a distinction between lamp tubes placed on the EU market manufactured from:
        i. recyclate produced from EoL fluorescent-lamp-glass collected and recycled in EU countries; and between
        ii. recyclate produced from EoL fluorescent-lamp-glass collected and recycled in non-EU countries?

Answer LightingEurope: Which kind of distinction is meant in the question?

The glass used in fluorescent lamps is either produced by LightingEurope members themselves or purchased from glass manufacturers. It is either produced in EU or outside EU. LightingEurope members only have information available from own production. According this knowledge recycling glass from end-of-life lamps is mainly used in EU glass production. Outside EU collection schemes are less available. Lamp glass can be exported to lamp production plants outside EU and then imported again with the lamps. As stated in the renewal application, to our best knowledge the percentage of recycled glass in the tubes is 30-40%. The source of the recycled glass is from lamps collected on the European market and own production. There is no import of broken lamps from outside the EU as far the LightingEurope members know.

    b. The application explains that the use of lead in the manufacture of fluorescent tube glass is not prohibited in countries outside the EU. Thus please explain how it is guaranteed that the presence of unintentional Pb in lamps manufactured with non-EU glass lamp recyclate is equivalent to levels in glass tube manufactured with EU recyclate, or at least within the allowances addressed in Ex. 5(b)?

Answer LightingEurope: The supply chain is organized in such a way that each manufacturer must ensure RoHS conformity of products by suitable measures e.g. according EN50581:2012. This includes the glass components. There is no difference to other parts, materials, components.

c. Please clarify if there are differences in the presence of lead in tubes manufactured in different regions and explain the nature of these differences.

Answer LightingEurope: Glass coming from different glass furnaces may have differences in composition due to the specific mix of cullet and raw material, but not regarding the presence of lead. In general new produced lamp glass is lead-free. Fluorescent lamps put on the EU market since Sept. 2010 have to be made of lead-free glass. No systematic differences could be recognized by LightingEurope members regarding the origin of the glass.

3. Regarding the share of lead in glass tubes and the amount of recyclate used for manufacture:
   a. Can a trend be observed/estimated regarding the presence of Pb in fluorescent-lamp tube glass since 2006?
   b. Can you estimate on this basis when it is expected that that the share of Pb as an impurity will allow compliance with RoHS without an exemption or why this trend is not expected to change in the short or medium term?

Answer LightingEurope: In the first RoHS directive, coming into effect in 2006, the use of Pb in glass for Fluorescent lamps was exempted. In the second edition, this exemption was restricted to 0.2%. Thus a significant reduction was realized, leading to the current situation that glass for fluorescent lamps is still diluted with a small amount of Pb, sometimes slightly above the generic threshold of 0.1% (as presented in the original LightingEurope paper). Hence in the long term, a declining trend of installed lamps with Lead containing glass is expected. On the other hand the market for fluorescent lamps is decreasing, which could lead to higher amounts of lamps or lamp glass produced outside EU. The rejection of the exemption could lead to the limitation of the use of recycling glass (from lamps coming from the market) for lamp glass production.

4. An OSRAM facility is mentioned where, for the manufacture of glass tubes, "*30 - 40 % recycling glass is used. Technically (theoretically) up to 80% is estimated to be possible… Source for the recycling glass… mainly glass from lamp recycling.* "
   a. Is the remaining share of glass, used for manufacture of new glass tubes, "newly manufactured glass" (i.e., use of virgin raw material) or are other types of recycled glass used in some cases as additional sources for manufacture of glass tubes, other than recycled lamp glass?

Answer LightingEurope: This is competency of a glass manufacturer. Usually newly manufactured glass is produced. The lamp glass has to be within the required specification.

b. Are there additional reasons for limiting the use of recycled glass in manufacture aside from compliance with the threshold of the current exemption? (e.g. impacts on the performance requirements of the glass tube)

Answer LightingEurope: This is competency of a glass manufacturer. One of the reasons is the availability of recycled glass materials.

c. "*Limitation of the use of recycling glass for lamp glass production*" is mentioned as a possible measure, understood to be aimed at ensuring similar lead presence between lamps of differing origin (for example EU manufactured lamps and imported lamps). Can you provide estimations as to the ranges of different glass types typically used to manufacture glass (i.e., shares of recyclate from EoL fluorescent lamp glass of varying origin: other recyclate : newly manufactured glass: other materials) and the subsequent amount (range) of Pb present in tube glass in the cases specified, as well as clarifying other possible differences between manufacture in the EU and outside of it?

Answer LightingEurope: The glass used in fluorescent lamps is produced by LightingEurope members themselves, but part of it is purchased. As stated in the renewal application, to our best knowledge the percentage of recycled glass in the tubes is 30-40%. The source of the recycled glass is from lamps collected on the European market and own production processes (the market estimation on their split is not available based on the best knowledge of LightingEurope members).
c. "Limitation of the use of recycling glass for lamp glass production" shall not be understood to be aimed at ensuring similar lead presence between lamps of differing origin but as a measure to ensure RoHS conformity of the homogenous material glass in a situation where inhomogeneous recycling glass batches are used for glass production.

5. The exemption is only relevant for lead in the glass tubes of fluorescent lamps. It is assumed that the market share of such lamps could change in the future in light of the changing share of other lighting technologies. Please estimate whether and how such trends may impact the amount of lead expected to be placed on the market through this application in the next 10 years.

Answer LightingEurope: As already indicated in answer to question 3, a significant reduction of Lead in glass was realized in the past years, leading to the current situation that glass for fluorescent lamps is still diluted with a small amount of lead , slightly above the generic threshold of 0.1% (as presented in the original LightingEurope paper). Hence in the long term, a declining trend of installed lamps with Lead containing glass will be observed. The rejection of the exemption could lead to the limitation of the use of recycling glass (from lamps coming from the market) for lamp glass production.

The McKinsey report predicts the change in market size towards 2020 this prediction is also referred to in VITO/VKH preparatory study[2], the linear fluorescent lamps market may go down by 30% by 2020, hence the value of Lead may go down with the same or higher speed (considering factors mentioned earlier).

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.

[2] VITO & VHK, report, Preparatory Study on Light Sources for Ecodesign and/or Energy Labelling Requirements ('Lot 8/9/19'). Draft Interim Report, Task 2 Markets, page 51