



LIGHTINGEUROPE

THE VOICE OF THE LIGHTING INDUSTRY

Request to renew Exemption 21

under the RoHS Directive 2011/65/EU

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

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2 Reason for application

Philips Lighting submits this application to: *Request for extension of existing Exemption no. 21. Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses*

Philips Lighting proposes to continue using the existing wording which is: *Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses*

Philips Lighting requests a duration of

Maximum validity period required

3 Summary of the exemption request

Per DIRECTIVE 2011/65/EU Article 5(2) Annex III Exemption 21 will expire automatically per 21/07/2016, unless an application for renewal has been made to the Commission in accordance with Annex V.

With reference to the above, this request concerns the extension of the exemption 21:

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

Lead in printing ink provides durability of product marking especially on glass bulb of lamps; maintain legibility of product marking throughout its lifetime which is required by legislations and product safety standards.

The lead free ink solutions have been found, but they cannot be effectively utilized in all situations with the required mark quality.

That the amount of lead is very low, of lesser interest

That is why Philips Lighting and other companies is requesting an extension without any limitation.

4 Technical description of the exemption request

4.1 Description of the lamps and their applications

4.1.1 Lamps covered by this exemption

This exemption covers lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses

This lead containing ink is used for marking Fluorescent tubes, PAR lamps and HID lamps like High Pressure Sodium (HPS), Quartz Metal Halide (QMH) and Ceramic Metal Halide (CMH)

Examples of lead containing and lead free marking can be found in the picture below.



Good marking with Pb containing ink



Marking with lead free ink in some applications



PAR lamp



High pressure sodium lamp



Quartz metal halide lamp



Ceramic metal halide lamp



Ceramic metal halide lamp

4.1.2 Applications covered by this exemption

All double capped fluorescent lamps. PAR lamps and HPS lamps, HPI lamps, MH lamps

4.1.3 Annex I category covered by this exemption

List of relevant Annex I categories for this exemption

- | | | | | | |
|----------------------------|----------------------------|----------------------------|----------------------------|---------------------------------------|-----------------------------|
| <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input checked="" type="checkbox"/> 5 | |
| <input type="checkbox"/> 6 | <input type="checkbox"/> 7 | <input type="checkbox"/> 8 | <input type="checkbox"/> 9 | <input type="checkbox"/> 10 | <input type="checkbox"/> 11 |

Application in other categories, which the exemption request does not refer to: N/A

Equipment of category 8 and 9: N/A

The requested exemption will be applied in

- ☐ monitoring and control instruments in industry
- ☐ in-vitro diagnostics
- ☐ other medical devices or other monitoring and control instruments than those in industry

Philips Lighting and other companies are of the opinion that lamps in general are category 5, because the majority is used for general illumination. However, they have some of the characteristics of components (used in luminaires), consumables (finite lifetime and regularly replaced) or spare parts (lamps in luminaires have to be replaced when they cease functioning). Some manufacturers of electrical equipment in other RoHS categories may install fluorescent lamps into their equipment for general illumination purposes and so they will need to use lamps that comply with the RoHS directive, however the products that they place on the market are not category 6 but may be household appliances, medical devices or potentially in any RoHS category 1 - 11.

Philips Lighting and other companies are aware of the difficulty to classify certain lamps unambiguously in the category set out by RoHS legislation. For lamp producers it is essential to have legal certainty regarding the possibility to put the products on the market irrespective of the planned application as we are not able to control the use of the lamps in products falling in other categories or out of the RoHS scope. In practice, most lamps are installed in buildings for lighting applications (category 5), but some are used in other types of equipment in all other RoHS categories. The way that lamps are used has no effect on lamp design so will not affect this exemption request.

4.2 Description of the substance

4.2.1 Substance covered by this exemption

Philips Lighting and other companies are asking for exempting

☒ Pb ☐ Cd ☐ Hg ☐ Cr-VI ☐ PBB ☐ PBDE

4.2.2 Function of lead in lamp components

Lead is needed to make a mark on the soda lime glass that durably stays on the lamp throughout the lifetime of the lamp. Lead helps the marking ink to fuse into the glass surface. The ink has to adhere to the glass within a few seconds without being damaged in many factories. In the black ink a so called lead containing glass frit is used as adhesion compound to the glass. In the green (lead free) ink an aluminium phosphate is used for the adhesion to the glass.

4.2.3 Location of lead in lamps

Lead is present in product marking fused into the surface of lamp glass bulb.

4.2.4 Amount of lead in ink

Double capped fluorescent lamps:

Total amount of lead on the stamp in TL: approximately 2 kg lead

Total amount of lead in HID lamps and Par lamps in Europe is less than 0.5 kg.

All lamps above mentioned: the amount of lead is very low, of lesser interest.

4.2.5 Environmental assessments, LCAs

To the best of Lighting Europe knowledge no lead specific LCA's are available.

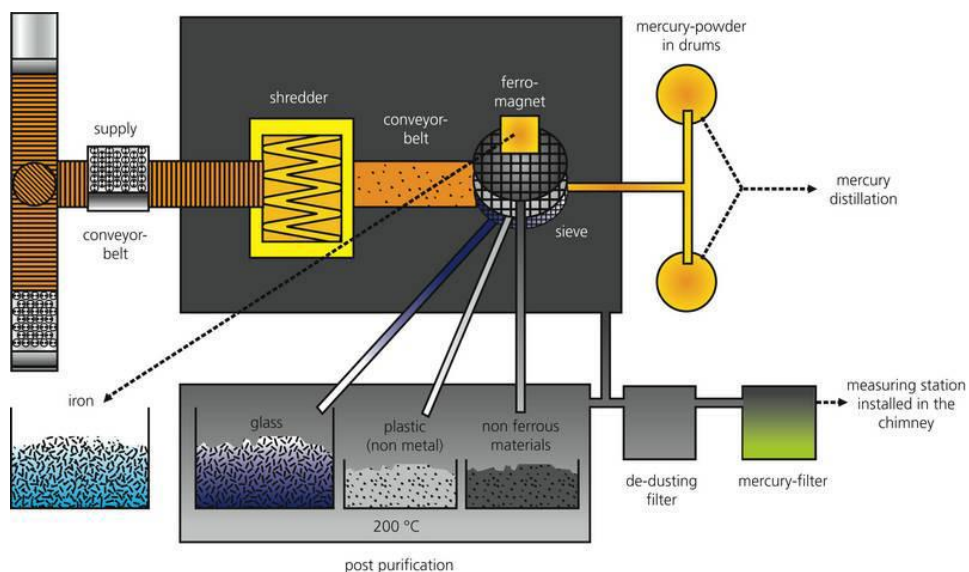
5 Waste management

5.1 Waste streams

- ☒ Article is collected and sent without dismantling for recycling
- ☐ Article is collected and completely refurbished for reuse
- ☐ Article is collected and dismantled:
- ☐ The following parts are refurbished for use as spare parts: _____
 - ☐ The following parts are subsequently recycled: _____
- ☐ Article cannot be recycled and is therefore:
- ☐ Sent for energy return
 - ☐ Landfilled

Lamps are in the scope of EU Directives 2002/96/EC - WEEE and 2012/19/EU- WEEE Recast. Take back systems are installed in all EU Member States: end users and most commercial customers can bring back the lamps free of charge. Fluorescent and HID lamps are collected separately from general household waste and separately from other WEEE waste. Below picture shows the various steps in the recycling process:

Figure 1: Recycling steps of fluorescent lamps in Indaver (Belgium).
Source: www.indaver.be/waste-treatment/recycling/mercurial-waste.html



European legislation on Waste Electrical and Electronic Equipment makes producers responsible for end of life products within this category as from August 13th, 2005. Target setting as consequence of the present legislation is 4 kg per inhabitant per year for all categories.

European Lamp Companies have founded Collection & Recycling Organizations in the EU Member-States, with the objective to organize the collection and recycling of gas discharge lamps. Goal is to comply with present and probable future EU legislation and meet or exceed national targets.

In general the following channels have been established in the respective member-states providing countrywide coverage:

- Direct collection from large end users:
Containers have been made available, ad hoc or permanently, and will be collected upon notification by the end user that the container is full.
- Collection through distribution:
Wholesalers and Retailers place collection means at their premises respectively in their shops. Collection is done upon notification.
- Collection through municipalities:
Where infrastructure allows collection means are placed at municipality depots.

Campaigns are being executed or have been planned to re-enforce the role of the government to educate the population that gas-discharge lamps have to be disposed of in an environmentally friendly way. An example of such a campaign is the distribution of ‘Jekko’ containers to 1 million households in the Netherlands. Another way of organising the take back for consumers is via supermarkets as done by Récylum in France.

5.2 Amount of Pb in WEEE

- ☐ In articles which are refurbished
- ☒ In articles which are recycled
- ☐ In articles which are sent for energy return
- ☐ In articles which are landfilled

Amount of substance entering the EU market annually (base year 2013) through application for which the exemption is requested:

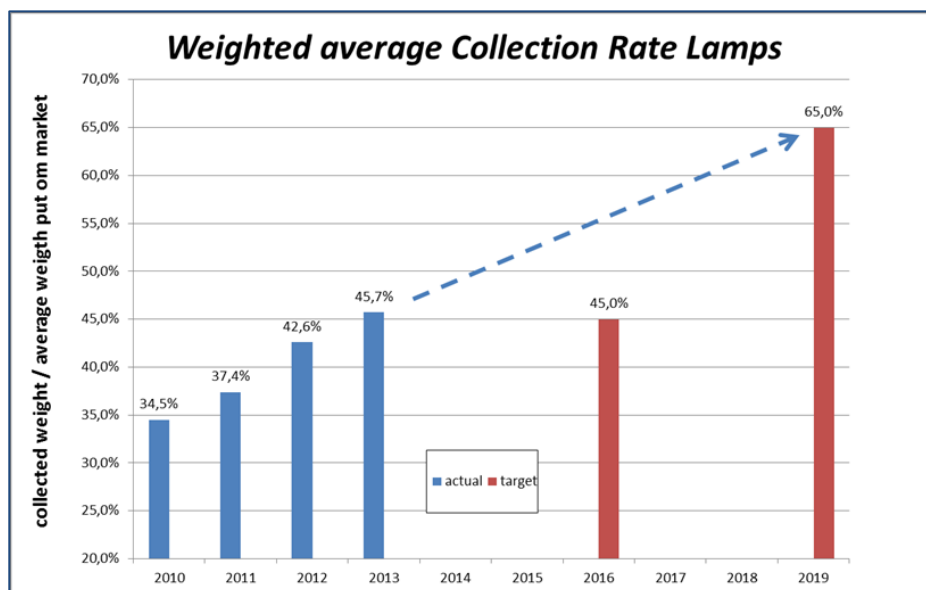


Figure 2: Collection rate of lamps

Reporting on the collection of lamps is available on 2 groups:

- CFL lamps and LED retrofit lamps
- Long CFL lamps without integrated ballast and Fluorescent lamps

The reported recycling percentage is growing, showing the efforts of the industry to collect the lamps.

6 Substitution

Can the substance of this exemption be substituted?

- ☐ Yes, by ☒ No
- ☐ Design changes:
- ☐ Other materials:
- ☐ Other substance:

6.1 Substituting lead (Pb) in the fluorescent technology, HID lamps, and other lamps

As lead in printing ink provides durability of product marking especially on glass bulb of lamps; maintain legibility of product marking throughout its lifetime which is required by legislations and product safety standards. As lead free black ink, applied in processes in different factories, does not always provide the durability of product marking the lamp does not comply with legislation and product safety standards.

The lead free ink solutions have been found, but they cannot be effectively utilized in all situations with the required mark quality yet.

Fluorescent lighting technology.

6.2 Substituting fluorescent technology by lead (Pb) free technology

6.2.1 *Feasibility of the alternatives*

Alternatives have been tested but cannot be effectively utilized in all situations with the required mark quality yet.

6.2.2 Availability of substitutes

☐ Yes

☒ No

Alternatives are available but they cannot be effectively utilized in all situations..
Damaging of the marking can already appear during processing of the lamps.

6.2.3 Impacts of substitution

If lead free stamp ink has to be introduced in Europe which do comply with legislations and other safety standards some companies from LightingEurope cannot always apply the required stamp in all situations.

6.2.3.1 Environmental impact of substitutes

Lead containing and lead free ink lamps have to be recycled

6.2.3.2 Health and safety impact of substitutes

Lamps:. Lead free alternatives (e.g. green ink) have been found.

Economic effects related to substitution:

- ☐ Increase in direct production costs
- ☒ Increase in fixed costs
- ☐ Increase in overhead
- ☒ Possible social impacts within the EU
- ☒ Possible social impacts external to the EU
- ☒ Other:

6.2.3.3 Impact of substitution on innovation:

Lamps: Focus of the current lighting industry is already on the further development of LED technology. An extension of the exemption will have no negative effect on the efforts to further innovate in LED.

6.2.4 Future trends of substitution

Lamps: LED technology performance is developing, however the balance between cost price, lifetime and efficiency and the speed in which it will take place is not yet clear.

6.3 Links to REACH, according to RoHS Directive Article 5(1)(a)

Do any of the following provisions apply to the application described?

no

- | | | |
|---|---|---------------------------------------|
| <input type="checkbox"/> Authorisation | <input type="checkbox"/> Restriction | <input type="checkbox"/> Registration |
| <input type="checkbox"/> SVHC | <input type="checkbox"/> Annex XIV | |
| <input type="checkbox"/> Candidate list | <input type="checkbox"/> Annex XVII | |
| <input type="checkbox"/> Proposal inclusion Annex XIV | <input type="checkbox"/> Registry of intentions | |

Provide REACH-relevant information received through the supply chain.

Not Applicable

7 Removal of Lead in ink

Can lead be eliminated?

- ☐ Yes.
☒ No.

The lead free ink solutions have been found, but they cannot be effectively utilized in all situations with the required mark quality.

8 Reduction of Pb content of lamps

Is partly possible . See earlier chapters