Notes on the consultation questionnaire regarding the ban on mercury lamps

The European Commission intends to completely ban mercury lamps for industrial purposes. This would drastically affect your and our business. We kindly invite you to assist us in preventing this ban.

Therefore, we kindly ask you to fill in this form and submit it to rohs@biois.eu **before the 27th of May, 2021**.
To assist you, we are providing suggestions for possible answers (in boxes and formatted in red), some of which are based on the statement that Ultralight is going to submit. Please edit these suggestions according to your own opinion and replace them with your own wording.

The text in *italic+red* is our annotation and should be deleted.

Your statements might be published. If some of your statements contain confidential information, please use the last page of this document for your confidential information and clearly state which parts of your contribution are to be treated confidential.

Please provide your contact data, in case Bio Innovation Service, the recipient of your contribution, needs to contact you for clarifications.

Upon submitting your contribution, please ask Bio Innovation Service for a formal receipt of your contribution as an evidence for your timely submittance.

Thank you for your support!
The Team of Ultralight AG

Legal notice

Ultralight AG is not in any way affiliated with Bio Innovation Service or the European Commission and their representatives involved in the public consultation for the Exemption No. 4(f) of RoHS Annex III.
We are providing our comments to the official questionnaire by Bio Innovation Service solely as an assistance to parties who are not deeply involved into the discussion regarding the ban on mercury for industrial applications.
Our only objective is to support those interested parties that are working to preserve the permit for the manufacture, sale and continued use of mercury-containing UV lamps for industrial purposes.

Please remove this complete page and the above content before submitting the form.

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Consultation Questionnaire Exemption No. 4(f) of RoHS Annex III

Current wording of the exemption:

Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex

Requested validity period: Maximum (5 years and 7 years (cat. 8 and 9) respectively)

ACRONYMS AND DEFINITIONS

UV	Ultra Violet
LED	Light-Emitting-Diode
Hg	Mercury
LEU	LightingEurope

1. INTRODUCTION

1.1. Background

Bio Innovation Service, UNITAR and Fraunhofer IZM have been appointed[1] by the European Commission through for the evaluation of applications for the review of requests for new exemptions and the renewal of exemptions currently listed in Annexes III and IV of the RoHS Directive 2011/65/EU.
VDMA and Lighting Europe submitted requests[2] for the renewal of the above-mentioned exemption. The request has been subject to a first completeness and plausibility check. The applicant has been re-quested to answer additional questions and to provide additional information, available on the request webpage of the stakeholder consultation[3].
The stakeholder consultation is part of the review process for the request at hand. 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.[4]

[1] It is implemented through the specific contract 070201/2020/832829/ENV.B.3 under the Framework contract ENV.B.3/FRA/2019/0017
[2] Exemption request available at RoHS Annex III exemption evaluation - Stakeholder consultation (biois.eu)
[3] Clarification questionnaire available at RoHS Annex III exemption evaluation - Stakeholder consultation (biois.eu)
[4] Directive 2011/65/EU (RoHS) available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32011L0065:EN:NOT

To contribute to this stakeholder consultation, please answer the below questions until the 27th of May 2021.

1.2. Summary of the Exemption Request

According to VDMA: "*The application for prolongation of the existing exemption refers to mercury-containing UV discharge lamps which are used for curing (e.g. of layers of inks and coatings, adhesives and sealants), for disinfection (e.g. of water, surfaces and air) and for other industrial applications (surface modification, surface activation) The application includes the following lamp types:*

- ***UV medium-pressure discharge lamps (MPL) for curing, disinfection and other industrial applications*** *(internal operating pressure > 100 mbar). The UV medium-pressure lamps can be doped with iron, gallium or lead in addition to the mercury they contain.*
- ***UV low-pressure discharge lamps for special purposes*** *in the high power range. […]*

Typical applications to be covered by this application include curing, e.g. of inks and coatings, disinfection of water etc., and other industrial applications like surface activation and cleaning.
It is technically not possible to replace mercury in special UV lamps with other materials/chemicals in order to achieve the same widespread radiation distribution. LED-based technologies are increasingly being used, which in certain applications (e.g. curing) also offer many advantages over mercury-containing UV lamps. Nevertheless, LED technologies cannot be used as an equivalent replacement in many applications. "

According to LightingEurope, *"[…]* The renewal application concerns lamps and UV light sources defined as:

- High Pressure Sodium (vapour) lamps (HPS) for horticulture lighting,
- Medium and high-pressure UV lamps for curing, disinfection of water and surfaces, day simulation for zoo animals, etc…
- Short-arc Hg lamps for projection, studio, stage lighting, microlithography for semiconductor production, etc…

Replacement of mercury and mercury containing lamps is impracticable:

- *The lamps covered by exemption 4(f) must remain available on the EU market:*
  - *For new equipment for certain applications where no functionally suitable alternatives are available*
  - *As spare parts for in-use equipment as replacing end-of-life lamps avoids having equipment become electronic waste before due time"*

We are a producer of printed matter (screen printing) based in CH-8640 Rapperswil and employ 5 people. We manufacture the following products: print finishing, graphic products, technical screen printing We use UV lamps for the following applications: Print finishing The percentage of UV-based products in our total production is: 30% Our annual lamp consumption is: 2 pieces / year The number and type of machines / devices with mercury-based UV technology are: 3 screen printing machines Our experiences with alternatives to UV lamps are as follows: do not know any alternatives UV lamps are still needed for the following reasons: There are no adequate alternatives.

Specific Statements
Please state your opinion on as many questions stated below as possible. Provide specific and detailed information rather than general statements wherever possible.
If you don't feel qualified to answer the specific questions below, please give detailed arguments and reasons why you still support the renewal of the exemption as requested by VDMA and LightingEurope.

2. QUESTIONS

1. VDMA and LightingEurope[2] requested the renewal of the above exemption for the maximum validity periods with the same scope and wording for all EEE of cat. 3 and 5 (VDMA) and cat. 1-10 (LEU).
   a. Please let us know whether you support or disagree with the wording, scope and requested duration of the exemption. To support your views, please provide detailed technical argumentation / evidence in line with the criteria[4] in Art. 5(1)(a).

The wording should be retained and an extension should be requested at least until 2026 and beyond. The reasons are: As long as there are no adequate alternatives. Reference to RoHS Art. 5 (1) (a): Exceptions for materials and components can be considered if: - "Their elimination or substitution by design changes or materials and components [...] is scientifically or technically impracticable" - " The reliability of substitutes is not guaranteed "-" The negative effects on the environment, health and consumer safety caused by substitution probably outweigh the overall benefits for the environment, health and consumer safety. "

   b. If applicable, please suggest an alternative wording and duration and explain your proposal.

From an industrial point of view, the shortening of the period of validity does not make sense, because the development of alternative solutions (e.g., based on UV LEDs) takes a lot of time. Especially, the development for new applications in the UVC area is still facing major challenges.
Furthermore, it can also be assumed that not all specific UV applications are well-known to VDMA and LightingEurope and have therefore been neglected to be investigated and considered in detail. The previous wording of the exception: "Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex" should therefore be retained unchanged.
With regard to the following current and future developments/processes/products, the availability of UV lamps containing mercury is indispensable for our company: ……
(e.g., air/water/surface disinfection, specific curing processes, surface treatment, special applications)

2. Please provide information concerning possible substitutes or elimination possibilities at present or in the future so that the requested exemption could be restricted or revoked.

a. Please explain substitution and elimination possibilities and for which part of the ap-plications in the scope of the requested exemption they are relevant.

The periodic system of the elements offers no alternative to mercury in discharge lamps (i.e., an "alternative filling") that would be a direct 100% compatible replacement. The physical properties of mercury make this material quite unique and ideally suited for discharge lamps (high vapor pressure, low boiling point, specific spectral lines in areas that are ideal for disinfection and photochemical reactions). Scientific and industrial approaches to compatibly replace mercury with an alternative substance while maintaining the specific beneficial properties of mercury discharge lamps have been ongoing for decades and have all failed.

- With respect to varnishes, replacement technologies based on LEDs can usually not provide the same degree of surface hardness, scratch resistance and product durability (automobile industry, wood industry)

- The use of replacement technologies usually has a strong influence on the underlying chemistry of curable paints and varnishes and requires high amounts of (toxic) photoinitiators. The light energy from LED lamps is not enough to cure the colors.

We don't know of any adequate alternatives.

b. Please provide information as to research to find alternatives that do not rely on the exemption under review (substitution or elimination), and which may cover part or all of the applications in the scope of the exemption request.

According to our experience, replacement of existing UV lamp system with alternatives leads to a manifold of problems including quality issues, process downtime, productivity decrease, high investment costs, higher overall operational costs. *(You can describe what experience you have made with those alternatives.)*

c. Please provide a roadmap of such on-going substitution/elimination and research (phases that are to be carried out), detailing the current status as well as the estimated time needed for further stages.

We don't see the existence of a roadmap for the complete substitution/elimination of mercury-based discharge lamps in most fields of application. There are other technologies

available (see above point …) which might justify investment into new machines and which might gain market share with respect to conventional UV applications over time. But for numerous existing machines/processes/applications, there is no reasonable replacement available.

3. Do you know of other manufacturers producing devices of comparable features and performance like the ones in the scope of this exemption request that do not depend on RoHS-restricted substances, or use smaller amounts of these substances compared to the applications in the scope of this exemption?

Since 100% replacement on existing installations is not possible, there is also no comparable product or device available with comparable features and performance.
Alternative products, when used with the alternative peripherals (other inks, varnishes, pre-treatment, ….), can have comparable features and performance in some applications (e.g., ink jet printing, general printing) but by for not in all other applications which need the specific spectrum of mercury for their performance.
(It is important to point out that it may not be possible to simply replace the UV lamps with mercury-free products. It depends on the respective application whether alternative systems (e.g., UV-LEDs) can be used and which changes need to be made to the machines and processes (e.g., materials, handling) and the design of the overall system.)

4. As part of the evaluation, socio-economic impacts shall also be compiled and evaluated. For this purpose, if you have information on socioeconomic aspects, please provide details in respect of the following:
   a. What are the volumes of EEE in the scope of the requested exemptions which are placed on the market per year?

We don't know of any exact numbers that accurately describe the entire 4 (f) market. For our company / our customers 2 pieces of lamps are used per year.

   b. What are the volumes of additional waste to be generated should the requested ex-emption not be renewed or not be renewed for the requested duration?

Most of the existing machines on the market that run on mercury discharge lamps would have to be considered additional waste and disposed of. In many cases it is not economically and / or technologically feasible to retrofit existing devices with alternative light sources. If UV lamps are no longer available, our print products would have to be produced again with solvent-based inks.

   c. What are estimated impacts on employment in total, in the EU and outside the EU, should the requested exemption not be renewed or be renewed for less than the re-quested time period? Please detail the main sectors in which possible impacts are expected – manufacturers of equipment in the scope of the exemption, suppliers, re-tail, users of MRI

devices, etc.

This would have the following effects on our company / our customers: We would have to switch to solvent-based paints, which would put additional strain on the environment in other ways. Or we would have to downsize around 30% of our product portfolio and cut jobs.

d. Please estimate additional costs associated should the requested exemption not be renewed, and how this is divided between various sectors (e.g. private, public, industry: manufacturers, suppliers, retailers).

We / our customers have to invest in systems and machines with a total value of around € 2 million.

5. Any additional information which you would like to provide?

We believe that the responsible authors of the pending mercury ban dramatically underestimate the global impact of a mercury ban on industries, products, markets, and lastly employment opportunities and end consumers. The dramatic socio-economic outcome of a mercury-ban bears no meaningful relation to the comparatively very small amount of mercury that is really brought into the market by mercury-containing discharge lamps. Used lamps can be recycled and the mercury content can be reused for new lamps. If all participants in the market actively use the recycling opportunities, the mercury content for discharge lamps can be confined to closed-loop processes without damage or impact to the environment and personal health. We would like to strongly encourage policy makers to invest their effort into a well-organised recycling system including increasing the public awareness on the necessity of actively participating in the recycling loop. This is a win-win situation for all involved parties to the best outcome of having the best technologies available for the specific needs and without banning certain products, machines, technologies or markets for “the worse”.

Please note that answers to these questions can be published in the stakeholder consultation, which is 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.
Please do not forget to provide your contact details (Name, Organisation, e-mail and phone number) so that the project team can contact you in case there are questions concerning your contribution.

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