

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 appointed¹ 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 requests² 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-requested to answer additional questions and to provide additional information, available on the request webpage of the stakeholder consultation³.

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

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),*

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 \(biois.eu\)](https://biois.eu/rohs-annex-iii-exemption-evaluation-stakeholder-consultation)

³ Clarification questionnaire available at [RoHS Annex III exemption evaluation - Stakeholder consultation \(biois.eu\)](https://biois.eu/rohs-annex-iii-exemption-evaluation-stakeholder-consultation)

⁴ Directive 2011/65/EU (RoHS) available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32011L0065:EN:NOT>

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:
 - o For new equipment for certain applications where no functionally suitable alternatives are available
 - o As spare parts for in-use equipment as replacing end-of-life lamps avoids having equipment become electronic waste before due time”

GENERAL INFORMATION:

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BUSINESS FIELD: DESIGN AND PRODUCTION OF UV CURING AND COATING EQUIPMENT FOR PRINTING & PACKAGING INDUSTRY

2. QUESTIONS

1. VDMA and LightingEurope² 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 re-requested duration of the exemption. To support your views, please provide detailed technical argumentation / evidence in line with the criteria⁴ in Art. 5(1)(a).

We support the wording and support its extension until at least 2026 and even more. Our opinion is completely based on the criteria precisely indicated in Art. 5 (1) (a), namely:

Exemptions for materials and components may be considered, if:

- “their elimination or substitution via design changes or materials and components... is scientifically or technically impracticable”,
- “the reliability of substitutes is not ensured”,

- “the total negative environmental, health and consumer safety impacts caused by substitution are likely to outweigh the total environmental, health and consumer safety benefits thereof”.

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

For many industries, there is no practical alternative to replace the use of mercury-containing UV lamps. Replacing UV lamps with UV LEDs is still not possible in many technological applications and no progress has been made in the development of such a replacement. For example, this applies to the printing industry (offset and silk screen printing), UV coating in the furniture industry and many other developed industries.

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 applications in the scope of the requested exemption they are relevant.

There are no any chemical elements offers no alternative to mercury in discharge lamps that would be a direct 100% compatible replacement. Just only the physical properties of mercury make this material quite unique and ideally suited for discharge lamps providing specific spectral lines (320-365-420 nm) that are ideal for industry photochemical reactions are necessary for fast speed UV curing of many items of inks and varnishes. Just only mercury UV lamps can irradiate enough level of power of UV-light necessary to high production UV-curing of main volume of industrial coatings at the market.

Other industrial UV light sources like UV-LEDs available, but their industrial usage is very limited for similar processes. There are the following reasons limiting usage of UV LEDs:

- direct replacement (exchanging only the UV lamp to UV LED COB) is impossible due to radical differences in technical design and principles of power supply units,

-due to high cost of photo initiators for UV LED curable materials the market offers of industrial inks (except digital printing) are limited and most customers worldwide cannot change their business even within long perspective because they cannot get necessary materials,

-the middle price photo initiators for UV LED curable transparent varnishes have yellowish shade. For good transparency of UV LED curable varnishes it is necessary to use very expensive clear photo initiators (price of such UV LED varnishes are 5-7 times higher to price for ordinary UV curing varnishes). Changing to UV LED curable coatings leads to radical increasing of production cost and final prices in printing and furniture industries. In current not good economic situation much people in different industries will get additional problems as lost working places and falling of demand,

- also the replacement technologies based on LEDs can usually not provide the same degree of surface hardness, decorative attraction, scratch resistance, product durability like in case of curing with ordinary mercury UV-lamps.

- 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.

Based on our experience in UV printing industry within 25 years we are sure that mentioned replacement of existing mercury UV lamps with alternatives leads to a manifold of global industrial problems including quality issues, stops of many productions, downtime, productivity decrease, high investment non planned costs, strong impact to small and middle businesses, increasing of overall operational costs for printing and packaging industry, furniture production, automotive industries and etc. At the present time there is no any efficient alternative to mercury UV lamps.

- 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.

At current technical level of UV-light technology we don't see the existence of a roadmap for the complete substitution/elimination of mercury-based discharge lamps in most fields of application.

We are sure that the best way is not a ban, but the promotion of business responsibility for the preservation of the environment, control and implementation of more and more advanced technologies for the collection and disposal of used UV lamps.

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 mercury UV lamps is not possible, there is no comparable industrial UV light sources or devices available with comparable features and efficiency. Specific spectrum and power of UV lamps cannot be replaced with any another UV light technology.

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 can speak just about our East market like Kazakhstan, Russia, Belorussia and some Eastern European countries and just about printing industry we know well. We have hundreds customers in this field using UV lamps in their business and to change it to UV LED is impossible for them.

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

Most UV curing machines using UV lamps on the market would have to be considered as additional waste and would have to be disposed of. In many cases, it is economically and/or technologically not feasible to retrofit existing equipment with alternative light sources.

Many customers will start to use low cost UV lamps made in Asian countries. Such UV lamps have short lifetime due to their lower quality. That means that quantity of waste will be radically increased because customers will need to change UV lamps more often.

- 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-requested 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.

We cooperate with EU companies (from Austria, Switzerland, Germany) which supply us UV-lamps and power units we use in machinery produced by our company. In case if the requested exemption not be renewed all these companies will be closed and the tens of the same companies in EU will be closed. Hundreds of high-class engineers and high skill workers will lose their jobs. Tens of business owners will lose their business and production property.

It will touch about hundred manufactories produce UV curing equipment in Italy, Germany, France, Netherlands (most of them are very famous and have long business history).

It will touch UV inks and coatings EU big manufactories because demand on their materials will fall down. They will need to lay off workers en masse.

It is impossible to detail the impact to employment in such industries like printing and packaging, furniture production. These industries are using thousands of UV curing lines and the high cost of retooling production will inevitably lead to staff cuts to compensate for unplanned costs.

- 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).

Heavy investment costs for companies into new equipment, at the same time costs for disposal of no longer usable machines and equipment.

The increase in environmental waste pollution due to the use of low-quality cheap UV lamps and materials from Asian countries by many enterprises that cannot afford the transition to new UV LED curing technology.

Large reputational and moral losses of both regulatory commissions and businesses of various levels.

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

We support the opinion 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 agree this above statement to be published within the context of this consultation.

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.