General information
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The company ELMAG Superfici SpA is located in Villasanta (MB) in Northern Italy. Elmag is part of the SCM Group. In our Italian sites (production and offices) we employ ca. 100 People. Over the last 5 decades of activity, Elmag has produced and placed on the markets worldwide thousands of machines equipped with UV systems. A percentage of 30% of our total business depends directly or indirectly on the availability of UV Lamps. In addition to machines and equipment, Elmag Superfici as a leading OEM of machinery for the Graphic and Wood working industry, has been supplying in the last 30 years over 10.000 UV lamps as original spareparts to our customers in the following sectors:

- Wood surface finishing
- Graphic Industry (Offset, Flexography, Screen printing)
- Printing/decorating on Metal, Ceramic and Glass
- Label industry
- Food Packaging Industry
- Cosmetic and Medical Packaging,
- Security paper printing

Our experiences with potential alternatives to conventional discharge UV lamps are the following:
We have tested alternatives, in particular the UV LED Technology in our laboratory, and we also have started equipping some machines with UV LED instead of conventional UV but for the majority of applications introducing this new technology on existing machines would be either not feasible or far too costly and not efficient enough or not applicable at all.

Conventional discharge UV Lamps still offer a wide range of technical advantages:

- UV coatings, lacquers, inks are applicable on almost any surface including wood and flexible substrates like paper, metallic films and plastics
- during the UV curing process there is low or non-existent solvent emission into the air
- UV lamps offer a wide variation of UV Spectrum (254 nm – 450 nm)
- UV Systems for UV Lamps are affordable. By contrast, many of our customers would not be willing or able to invest in UV LED Technology as this technology is much more more expensive than conventional UV. Also, the inks and coatings needed for UV LED processes, having a different composition than conventional UV products, are much more expensive.

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:

Reference to RoHS Art. 5(1)(a): 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"*
- there is no scientifically equivalent light source available to replace mercury-based UV lamps. Furthermore, it is technically and economically impracticable to substitute mercury-based UV systems with alternatives like UV LEDs on already-installed productive equipment.
- *"the reliability of substitutes is not ensured"*
- For use with alternative light sources, the chemistry of the formulations must be changed. This is an ongoing process, and the reliability of the new substances has not yet been widely demonstrated in terms of long-term stability and reliability. In terms of quality, many of these substitutes do not meet established standards.

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) is still in progress and will take a lot of time.

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.

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.

The physical properties of mercury make this material 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.

There are other mercury-free types of discharge lamps and other light sources like UV-LEDs available, which can, to some extent, be used for similar processes. There are, however, some very severe limitations:

- Direct replacement (exchanging only the lamp) is in most cases technologically not possible

- Replacement of existing machines/processes with alternative light sources (if available) usually requires additional steps, which may include:
  - replacement of power supplies and peripheral electrical components
  - replacement or alteration of inks and varnishes
  - use of other substrates
  - necessity for (other) pre-treatment technology
  - necessity for inert production environments (expensive use of nitrogen or carbon dioxide)
  - change of UV measurement equipment (different spectral sensitivity)
  - change of process speeds (usually substantial speed and productivity decrease)
  - heavy redesign of machine equipment
  - complications like cross-sensitivity to daylight and/or artificial lighting

With respect to varnishes, replacement technologies based on LEDs can usually has a heavy impact on the underlying chemistry of curable inks and varnishes, requiring high amounts of (toxic) photo initiators

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 Systems with alternatives leads to a huge number of problems including quality issues, process downtime, productivity decrease, high investment costs, higher overall operational costs.

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 the current state of technology, there is no possibility for the complete substitution 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?

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 far not in all other applications which need the specific spectrum of mercury for their performance.

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 do not know exact figures describing the whole market of 4(f) exactly, as no specific studies are available, but we refer to the study which VDMA has mentioned in their report.

   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 existing machines on the market running with mercury discharge lamps 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.

      If UV lamps are no longer available, all processes of UV polymerisation and curing present in wood painting and printing lines, are no longer usable. As an immediate impact on our company there would be strong technical limitations. We will no longer be able to supply our customers with spareparts which will have an extremely negative effect on their production. Stored UV materials, replacement lamps and entire machineries of a value of thousands of Million EURO would have to be scrapped.

   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.

      Most employers of mercury-based UV technology would be confronted with a professional ban, leading to huge amount of unemployment and loss of products and productivity. Many companies and factories would stop existing.

      We don't have exact figure and can only state to the best of our knowledge that thousands of companies exist only in the EU that employ UV Technology based on mercury lamps. Some of them rely to up to 100% on the availability of mercury lamps (e.g., lamp manufacturers, power supply manufacturers, quartz suppliers, UV measuring device manufacturers, printers and coaters and many more). The missing renewal of the exemption would ultimately threaten the survival of our company and have a devastating impact on the majority of our customers.

   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).

      Unemployment costs for thousands of personnel in the wood finishing and the graphic industry.

Heavy investment costs for companies into new machineries/equipment, at the same time costs for disposal of no longer usable machines and equipment. Loss of product diversity. Already signed investments in production machineries and UV Lines are off the table. This will affect our suppliers and also sub-suppliers.

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

The 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 recommend the EC to focus their effort on a well-organised recycling system including increasing the public awareness on the necessity of actively participating in the recycling loop.

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.