NARVA Lichtquellen GmbH + Co. KG
Industriegebiet Nord | Erzstraße 22 | 09618 Brand-Erbisdorf | Germany

+49(0) 37322 / 170
office@narva-bel.de
www.narva-bel.de

Exemption Request Form

Date of submission: 2023-08-22

1. Name and contact details

1) Name and contact details of applicant:

Company:	NARVA Lichtquellen GmbH + Co. KG	Tel.:	+49 37322 170
Name:	Dr. Olaf Hansen	E-Mail:	Dr.Olaf.Hansen@narva-bel.de
Function:	CEO	Address:	Erzstraße 22 09618 Brand – Erbisdorf Germany

2) Name and contact details of responsible person for this application (if different from above):

Company:	NARVA Lichtquellen GmbH + Co. KG	Tel.:	+49 37322 17263
Name:	Caroline Seidel	E-Mail:	c.seidel@narva-bel.de
Function:	Product Management	Address:	Erzstraße 22 09618 Brand - Erbisdorf Germany

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2. Reason for application:

Please indicate where relevant:

- ☐ Request for new exemption in:
- ☐ Request for amendment of existing exemption in
- ☒ Request for extension of existing exemption in
- ☐ Request for deletion of existing exemption in:
- ☐ Provision of information referring to an existing specific exemption in:
  - ☒ Annex III ☐ Annex IV

No. of exemption in Annex III or IV where applicable: 2(b)(4)- I

Proposed or existing wording: existing

Duration where applicable: maximum validity period required

- ☐ Other: _____

3. Summary of the exemption request / revocation request

The exemption in directive 2011/65/EU expires on 24.02.2025 for annex III 2(b)(4)- I.

NARVA Lichtquellen GmbH + Co. KG submits this application to:

Request for extension of existing exemption no. 2(b)(4)- I.

NARVALichtquellen GmbH + Co. KG proposes to continue using the existing wording:

Lamps for other general lighting and special purposes (e.g. induction lamps): 15 mg

NARVA Lichtquellen GmbH + Co. KG requests a duration of:

Maximum validity period required.

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4. Technical description of the exemption request / revocation request

(A) Description of the concerned application:

1. To which EEE is the exemption request/information relevant?

   Name of applications or products:

   - Reptile and Bird Light (combines VIS and UV light + if relevant, thermal radiation)
   - CIE standard illuminant D_{65} (Norm light for colour matching and photostability tests)
   - Special photostability test lamps (with spectral range, which also contains UV)
   - Red Light (collagen lamps, Food Light)
   - Blue Light
     - Coral zooxanthellae symbioses (according "Ecodesign Regulation" (EU) 2019/2020 Annex III 3. (g))
     - Aquaristic Light
     - 003S (technical application: e.g. curing of contact lenses, medical therapy: e.g. psoriasis)
     - 0182 (Super Actinic lamp for technical purposes, medical therapy: e.g. Crigler-Najjar-Syndrome, jaundice)
     - skin cancer therapy and non-UV phototherapy treatment

a. List of relevant categories: (mark more than one where applicable)

☒ 1	☐ 7
☒ 2	☒ 8
☐ 3	☒ 9
☐ 4	☐ 10
☒ 5	☐ 11
☐ 6	

b. Please specify if application is in use in other categories to which the exemption request does not refer: _____

c. Please specify for equipment of category 8 and 9:

The requested exemption will be applied in

☒ monitoring and control instruments in industry

☐ in-vitro diagnostics

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☒ other medical devices or other monitoring and control instruments than those in industry

2. Which of the six substances is in use in the application/product?

   (Indicate more than one where applicable)

   ☐ Pb ☐ Cd ☒ Hg ☐ Cr-VI ☐ PBB ☐ PBDE

3. Function of the substance:

   Fluorescent lamps are low-pressure discharge lamps. The mercury atoms in a gas phase inside were stimulated while an electric current flows through the lamp bulb. When the excited atoms return to the basic state, they emit UV radiation. The UV light generated by mercury will be converted into visible and/or special UV light (depends on phosphor). The phosphor is inside of the surface of the glass bulb.

4. Content of substance in homogeneous material (%weight): Mercury content, from < 2 mg up to a maximum of 15 mg per lamp depending on lamp type and application

5. Amount of substance entering the EU market annually through application for which the exemption is requested:

   We cannot give an exact value, but the application particularly refers to niche market products that have only a very small proportion of the total mercury. The proportion by our company is estimated at 0.3kg of mercury per year.

6. Name of material/component: Mercury

7. Environmental Assessment: unknown

   LCA: ☐ Yes
   ☒ No

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(B) In which material and/or component is the RoHS-regulated substance used, for which you request the exemption or its revocation? What is the function of this material or component?

As described in 4.(A).3, mercury is the critical component for the functioning of a discharge lamp. Depending on the phosphor, a variety of spectra can be created. Fluorescent lamps have a clear advantage, especially in applications that require UV and VIS components in a spectrum. They produce a homogeneous illumination and are significantly cheaper than e.g. LEDs.

(C) What are the particular characteristics and functions of the RoHS-regulated substance that require its use in this material or component?

Mercury is essential for fluorescent lamps. The mercury is inside of a vacuum proved glass vessel. Without mercury the lamp cannot work. The amount of mercury which is needed for the low pressure discharge process is very low, significantly below 100 µg for a double capped linear fluorescent lamp. But there are many processes within the burner which make a part of the mercury unavailable for the discharge over lifetime. This is called mercury consumption and is the reason why more mercury has to be dosed, so that the intended lifetime is shortened due to low available mercury.

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5. Information on Possible preparation for reuse or recycling of waste from EEE and on provisions for appropriate treatment of waste

1) Please indicate if a closed loop system exist for EEE waste of application exists and provide information of its characteristics (method of collection to ensure closed loop, method of treatment, etc.)

In Europe exists a closed loop system for fluorescent lamps - LIGHTCYCLE

2) Please indicate where relevant:

☒ 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: mercury, glass, metals, partially rare earth materials (from phosphor)
- ☐ Article cannot be recycled and is therefore:
- ☐ Sent for energy return
- ☐ Landfilled

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3) Please provide information concerning the amount (weight) of RoHS substance present in EEE waste accumulates per annum:

☐ In articles which are refurbished	_____
☒ In articles which are recycled	detailed information by LIGHTCYCLE
☐ In articles which are sent for energy return	_____
☐ In articles which are landfilled	_____

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6. Analysis of possible alternative substances

(A) Please provide information if possible alternative applications or alternatives for use of RoHS substances in application exist. Please elaborate analysis on a life-cycle basis, including where available information about independent research, peer-review studies development activities undertaken

Mercury is not replaceable in fluorescent lamps based on working principle.

(B) Please provide information and data to establish reliability of possible substitutes of application and of RoHS materials in application

Mercury is not replaceable in fluorescent lamps based on working principle.

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7. Proposed actions to develop possible substitutes

(A) Please provide information if actions have been taken to develop further possible alternatives for the application or alternatives for RoHS substances in the application.

There are first LED solutions on the market. These are not 1:1 replacements. When it comes to homogeneous illumination, fluorescent lamps have a clear advantage, and the difference is particularly clear with lamps that combine UV and VIS. In addition, there is a lack of long-term studies on the tolerability of the flicker effect, especially in the area of reptiles/birds. In addition, the price of the LED is significantly higher, which

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increases considerably as soon as UV LEDs are required. Furthermore, there is no compatibility for existing applications.

(B) Please elaborate what stages are necessary for establishment of possible substitute and respective timeframe needed for completion of such stages.

We are dependent on the further development of the individual LEDs. We cannot give a timeline because we do not develop any LEDs ourselves, we could only assemble the appropriate modules when they are available.

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8. Justification according to Article 5(1)(a):

(A) Links to REACH: (substance + substitute)

1) Do any of the following provisions apply to the application described under (A) and (C)?

- ☐ Authorisation
  - ☐ SVHC
  - ☐ Candidate list
  - ☐ Proposal inclusion Annex XIV
  - ☐ Annex XIV
- ☒ Restriction
  - ☒ Annex XVII, **Restrictions do not apply to our use case**
  - ☐ Registry of intentions
- ☐ Registration

2) Provide REACH-relevant information received through the supply chain.
Name of document: /

(B) Elimination/substitution:

1. Can the substance named under 4.(A)1 be eliminated?

☐ Yes. Consequences? _____

☒ No. Justification: Mercury is essential for fluorescent lamps. Without mercury the lamp cannot work. No technologies could be developed having similar high efficiencies.

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2. Can the substance named under 4.(A)1 be substituted?

☐ Yes.

☐ Design changes:
☐ Other materials:
☐ Other substance:

☒ No.

Justification: Mercury is essential for fluorescent lamps. Without mercury the lamp cannot work.

LED lamps replacing lamps covered by exemption 2(b)(4)- I are nearly not available in the EU market. Fluorescent lamps are very efficient for lamps which combine VIS,UV and heat. The reliability has proven itself over decades of use in the market.

3. Give details on the reliability of substitutes (technical data + information):_____

4. Describe environmental assessment of substance from 4.(A)1 and possible substitutes with regard to
   1) Environmental impacts: The effects are well known for mercury containing lamps. See exemption request from Lighting Europe.
   2) Health impacts: The effects are well known for mercury containing lamps. See exemption request from Lighting Europe.
   3) Consumer safety impacts: The effects are well known for mercury containing lamps. See exemption request from Lighting Europe.

⇨ Do impacts of substitution outweigh benefits thereof?
Please provide third-party verified assessment on this: _____

(C) Availability of substitutes:

a) Describe supply sources for substitutes: not available, detailed information by Lighting Europe
b) Have you encountered problems with the availability? Describe: _____
c) Do you consider the price of the substitute to be a problem for the availability?
☒ Yes ☐ No
d) What conditions need to be fulfilled to ensure the availability? _____

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(D) Socio-economic impact of substitution:

⇨ What kind of economic effects do you consider related to substitution?

- ☒ Increase in direct production costs
- ☐ Increase in fixed costs
- ☒ Increase in overhead
- ☒ Possible social impacts within the EU -> compatibility, prize, function
- ☐ Possible social impacts external to the EU
- ☐ Other: _____

⇨ Provide sufficient evidence (third-party verified) to support your statement: _____

9. Other relevant information

Please provide additional relevant information to further establish the necessity of your request:

Product group Bird and Reptile Light

VIS light, UV radiation (A and B) and thermal radiation are required to keep reptiles in a species-appropriate manner. Visible light is critical to reptiles as it is for humans. UVA is part of reptile vision, so without it they're colorblind! A portion of UVA wavelengths (from 320nm - 335nm) also help regulate Vitamin D3 production and let reptile's body's know when they've created enough. UVB wavelengths along with proper temperature (usually additional heat), are responsible for vitamin D3 production in reptiles. UVB wavelengths along with proper temperature are responsible for vitamin D3 production in reptiles. Thermal radiation is critical also for maintaining body temperature (since reptiles are ectothermic).

In addition, different species require different intensities of VIS light and UV radiation. These Intensities are classified in so called Ferguson Zones. Lamps for Ferguson Zone 2-4 emitting mainly light in the ultraviolet spectrum so they fit to exemption 2(b)(4)- II. For Zone 1 the amount of UV light is at 36 – 38 % and belong to exemption 2(b)(4)- I. For the end user it is incomprehensible why one of 4 lamps from this package should no longer be allowed.

The first LED solutions are occasionally coming onto the market that are able to emit UVB, UVA and also near-Infrared, but they cannot be a 1:1 replacement for fluorescent lamps since the spectral emission from UV and NIR LEDs is more narrow band and does not cover the full spectral range needed. Fluorescent lamps are superior in their ability to mix emission from different phosphors compared to several LED diodes with different peak wavelengths. Additionally the efficiency and total power of NIR LEDs is too low compared to incandescent lamps. More electrical power is needed to provide the necessary heat and IR from LEDs than from incandescent lamps.

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(EU) 2019/2020 and (EU) 2019/2015 recognized the need for an exemption for this specific scope. If the extension is not approved, eco-design and RoHS are in conflict with each other.

In addition, the study situation on the subject of flicker effects is unexplored. In contrast to this, the compatibility of the fluorescent lamps has been confirmed over a long period of time.

Also, the prize for LED solutions is much higher than to fluorescent lamps about factor 10.

This product group is a very small part of the light sources. As a result, the impact on total mercury is negligible.

Product group photostability test lamps

A photostability testing is necessary for new active substances and medicinal and pharmaceutical products. For standardization, the following scientific guideline is prescribed in the EU: ICH Q1B. For the prescribed test, either D65 lamps or a combination of 2 lamps that come close to D65 are required.

D65 is a CIE standardized spectrum from 300 nm to 780 nm. This means that the spectrum has an UV and a VIS part. There are LED alternatives for the D65 on the market, but they do not contain any UV components. The application for this LED is not for photostability tests. The UV part of the spectrum is missing.

Product group Collagen

With collagen light therapy, the skin is irradiated with long-wave red light in the wavelength range between 590 and 640 nanometers. It penetrates deep into the skin, right down to the layers where collagen and elastin are located. There it stimulates natural renewal processes.

LED solutions cannot be regarded as a 1:1 replacement. Fluorescent lamps have the advantage that they ensure homogeneous light distribution and produce a broadband peak in the relevant red range. The current treatments are designed for fluorescent lamps and therefore also for the devices in the replacement. The lamps are also sometimes used in combination with tanning lamps, for which there is also no viable substitute due to the equipment.

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Product group Blue Light

With this request we would like to join the request of Lighting Europe Lighting.

For use in aquaristics, we would like to point out that the compatibility for animals, corals and plants has been clearly demonstrated over the long period of use. Especially for corals, the lamps are still allowed according to eco-design (EU) 2019/2020 Annex III 3. (g). A ban by the RoHS would contradict the eco-design. The replacement business is still covered by fluorescent lamps. It cannot be assumed that LED solutions will establish themselves on the mass market in the short term.

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10. Information that should be regarded as proprietary

Please state clearly whether any of the above information should be regarded to as proprietary information. If so, please provide verifiable justification:

Dr. Olaf Hansen
CEO