

## 1st Questionnaire Exemption Request No. 4(f)

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

### Abbreviations and Definitions

HG	Mercury
LEU	LightingEurope
VskE	The German Association for Label and Narrow Web Converters

### Background

The Oeko-Institut has been appointed within a framework contract<sup>1</sup> for the evaluation of an application for granting an exemption to be included in or deleted from Annexes III and IV of the new RoHS Directive 2011/65/EU (RoHS 2) by the European Commission.<sup>1</sup>

VskE has submitted the above mentioned request for exemption which has been subject to a first evaluation. The information you have referred has been reviewed and as a result we have identified that there is some information missing and a few questions to clarify concerning your request.

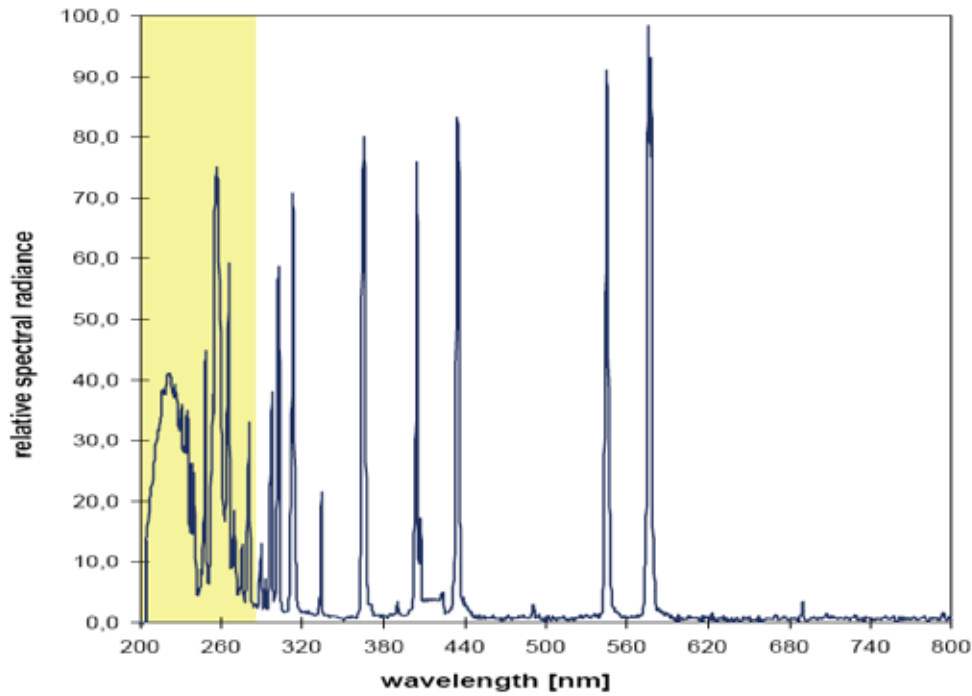
### Questions

1. The information available in your application as well as information provided by LightingEurope (LEU) in an application for the renewal of this exemption and in an application for the renewal of Ex. 4(a) suggests that applications falling under Ex. 4(f) would allow an amendment of the exemption wording in relation to certain application properties. Please comment on the following aspects:
  - a. In your application, it is apparent that lamps falling under this exemption mainly operate in the UVB and UVC spectra. Please specify the spectral range of lamps understood to fall under this exemption;

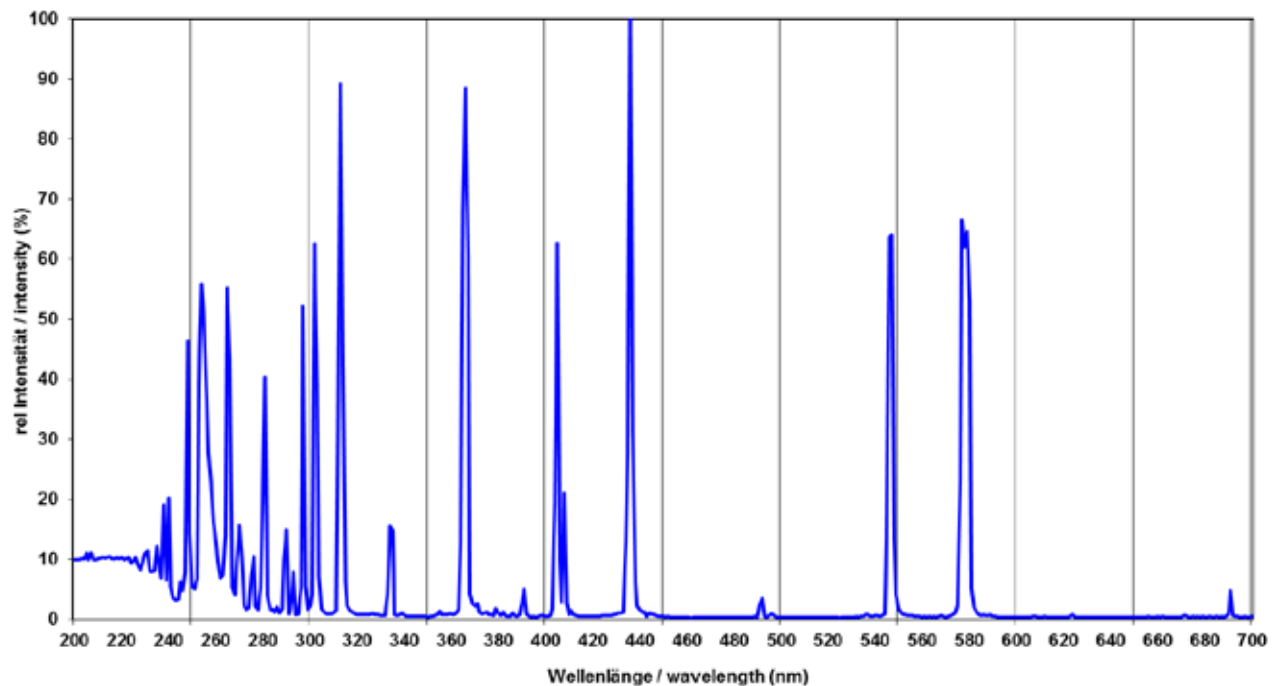
Typical medium pressure lamps emit UV-light beginning at 200 nm and therefore throughout the UVC (200 – 280 nm) and UVB (280 – 320 nm) into UVA (320 – 400 nm) range. Please see two examples of spectra below.

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<sup>1</sup> Contract is implemented through Framework Contract No. ENV.C.2/FRA/2011/0020 led by Eunomia



Spektrum Standard Hg (mercury) 100 W/cm



- b. It is understood that lamps falling under Ex. 4a also operate in the UVC range, however these are explained to also be characterised as low pressure discharge lamps, whereas from LEU it can be understood that lamps falling under Ex. 4(f) are medium or high pressure discharge lamps. Please explain if you support this statement or not and specify the pressure range of applications understood to fall under Ex. 4(f).

The described UV-lamps for curing fall under Ex. 4(f). The table below describes the differences between low and medium/high pressure lamps.

Type of lamp	Power consumption [W/cm]	Inner operating pressure [mbar]	Typical operating pressure [mbar]	Spectra characteristics
Low	0,5 - 5	≤ 100	< 10	Peak wave length
Medium, high	80 – 300, partly higher	> 100	≤ 5000	Continuum with peak lines

- c. It is understood from LEU that lamps falling under Ex. 4a, which generate UVC radiation shall not have a phosphor coating as the light spectra does not need to be transformed. Please clarify if lamps falling under Ex. 4(f) have a phosphor coating or not. If relevant, please specify relevant sub-groups of applications in this regard.

UV-lamps for curing falling under Ex. 4(f) do not have phosphor coatings.

2. It can be understood that possible LED alternatives that generate UV light in the relevant spectrum do not operate with the relevant output (i.e., are not powerful enough) – please specify on a quantitative basis what outputs are available and what outputs are needed.

LED is a light source with monochromatic output at peak wavelength levels. They are shown in the table below. UV-lamps supply the listed wavelength (and further ones) all at once! Needed power levels are calculated by 2/3 in reference to a UV-lamp.

Wavelength [nm]	LED output [mW]	UV-lamp output [mW]	To be seen as needed [mW]
205	Not available	> 12000	8000
215	Not available	> 15000	10000
225	Not available	> 22000	14500
235	Not available	> 24000	16000
245	0,1	> 9000	6000
255	1	> 30000	20000
265	10	> 24000	16000
285	25	> 4500	3000
300	25	> 6000	4000

3. Please provide an alternative proposal for the exemption wording, integrating the various performance specifications related to aspects described in your answers to Question 1.

The wording of the exemption should not be changed

**Please note that answers to these questions are to be published as part of the available information relevant for the stakeholder consultation to be carried out as 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.**