

## Adaption to scientific and technical progress under Directive 2002/95/EC

Results previous evaluation  
Exemption No. 18

“Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP ( $\text{BaSi}_2\text{O}_5:\text{Pb}$ ) as well as when used as speciality lamps for diazo-printing reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ( $(\text{Sr},\text{Ba})_2\text{MgSi}_2\text{O}_7:\text{Pb}$ )”

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## **5.6 Discharge lamps for special purposes containing lead as activator in the fluorescent powder (1% lead by weight or less)**

### **Requested exemption**

The European Lamp Companies Federation (ELCF) requests an exemption for Lead activated UV emitting phosphors as used in low pressure Hg based fluorescent lamps. The lead containing solid phosphor matrix determines both effective UV-C absorption (from the low pressure mercury discharge) and effective generation of (mainly) UV-A emission.

Presently two applications for lamps containing lead as activator in the fluorescent powder are denominated by the applicant:

- Sun tanning lamps contain phosphors such as BSP ( $\text{BaSi}_2\text{O}_5:\text{Pb}$ ), with an emission peak of 350 nm.
- Certain specialty lamps (applications: diazo-printing reprography, lithography, insect traps, photochemical and curing processes) contain the phosphors such as SMS ( $(\text{Sr},\text{Ba})_2\text{MgSi}_2\text{O}_7:\text{Pb}$ ), generating a broad emission peak centered at 360 nm.

The total annual amount of lead in these applications is approximately 600 kg (total EU market, 2004 figures).

### **Summary of justification for exemption**

The applicant justifies the request for exemption considering several criteria:

- Technically: no substitutes are known that results in a comparable emission spectrum and efficacy. Both BSP and SMS replacement would result in to lower efficacy and less optimal spectrum.
- Environment: through lower efficacy energy demand of lamps increases (about 10%).
- Consumer safety: Sun tanning equipment and solar lamps have to comply with IEC 60335-2-27. In order to protect consumer safety, the IEC norm is in the process to be amended. This poses new restrictions on spectral output distribution, like a defined ration of NMSC weighed output measured above and below 320 nm (Working group MT16 in SC34a). One to one substitution of phosphor in the same application, while covering the total application range, is therefore highly unlikely.

### **Draft recommendation**

Basically this exemption request should be granted according to Article 5 (1) b, as no substitutes are existent providing the lamp emission spectrum and lamp efficacy. Due to the considerable higher energy demand of lead-free UV emitting phosphor substitution would result in higher resource consumption and emissions form electric power generation incl. upstream material flows. Furthermore it is unlikely whether standards concerning consumer safety could be met with the lead-free substitutes.

However the exemption should be restricted to those applications for which lead as activator in the fluorescent powder is currently used. Against this background we suggest the following wording:

*"Lead as activator in the fluorescent powder (1% lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (BaSi<sub>2</sub>O<sub>5</sub>:Pb) as well as when used as speciality lamps for diazo-printing reprography, lithography, insect traps, photochemical and curing processes) containing phosphors such as SMS (Sr,Ba)<sub>2</sub>MgSi<sub>2</sub>O<sub>7</sub>:Pb)."*

## **5.7 Discharge lamps containing lead in the form of an amalgam**

### **Requested exemption**

The European Lamp Companies Federation (ELCF) requests an exemption for very compact Energy Saving Lamps (ESL) with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and PbSn-Hg as auxiliary amalgam. These substances control the Hg - vapour pressure inside small compact fluorescent lamps (especially the types with a closed cover) stabilizing the light output and lamp efficacy over a wide ambient temperature range, which makes it possible to replace incandescent lamps by energy saving lamps in a wide range of applications, both indoor and outdoor. Energy Saving Lamps can only be made in GLS dimensions and shape when Pb-containing amalgam can be applied.

The total annual amount of lead in this application is about 300 kg (assuming that 15 Million out of 150 Million CFL-I lamps sold across Europe contain max. 20 mg Pb contained in amalgam (total EU market, 2004 figures).

### **Summary of justification for exemption**

The applicant justifies the request for exemption considering several criteria:

- Technically: Alternative, Pb-free amalgams are not able to create optimum Hg pressure in ESL's with GLS-equivalent dimensions. Consequently either light output will be less when maintaining GLS dimensions, or product dimensions will be significantly bigger when maintaining the light output. This design change must be regarded as technically impracticable since not meeting consumer requirements.
- Environment:
  - Substitution to non-lead containing amalgams greatly limits the possibility to downsize CFL-I lamps to the size and shape of GLS bulbs (especially for the higher CFL-I wattages i.e. equivalents of 60/75/100W GLS lamps). Size reduction is vital for the acceptance of ESL's as replacement for GLS lamps.