

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

Results previous evaluation
Exemption No. 26

“Lead oxide in the glass envelope of Black
Light Blue (BLB) lamps”

(Excerpt from Öko-Institut Report 2006;
Annex 1 Monthly Report 4)

Öko-Institut e.V.

Freiburg Head Office

P.O. Box 50 02 40
79028 Freiburg, Germany
Street Address
Merzhauser Str. 173
D-79100 Freiburg
Tel. +49 (0)761 – 4 52 95-0
Fax +49 (0)761 – 4 52 95-88

Darmstadt Office

Rheinstraße 95
64295 Darmstadt, Germany
Tel. +49 (0)6151 – 81 91-0
Fax +49 (0)6151 – 81 91-33

Berlin Office

Novalisstraße 10
10115 Berlin, Germany
Tel. +49 (0)30 – 28 04 86-80
Fax +49 (0)30 – 28 04 86-88

For some applications, the use of clips is an alternative, but must be considered on a case to case basis, according to the applicant. As a result, a generally appropriate substitute technically and scientifically is not at hand. It is therefore recommended to grant this exemption. The scientifically and technically accurate wording for this exemption, in line with Art. 5 (1) (b) of the RoHS Directive, should be

“Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multi layer capacitors”.

5.3 Special purposes Black Light Blue (BLB) lamps, containing lead in the glass envelope – ELCF (set 1 request No. 17)

5.3.1 Description of requested exemption

The European Lamp Companies Federation (ELCF) requests an exemption for PbO in the glass envelope of Black Light Blue (BLB) lamps. Typical applications of this kind of lamps are money checking, lamps for leak detectors, disco-lighting etc.

These lamps efficiently emit near ultraviolet rays at 315nm to 400nm which have strong photochemical and fluorescent effects. Through the usage of a special deep blue filter glass visible rays and transmits near ultraviolet rays are absorbed.

According to the applicant lead is essential for creating optimal optical properties: maximum transmission of UV light and minimum visible light transmission.

The total annual amount of lead in this application is about 50.000 kg p.a. (total EU market, 2004 figures). Compared to the usage of Pb respectively PbO in other discharge lamp applications (see monthly report 2, section 5.5 to 5.8) these figures are comparatively high.

5.3.2 Summary of justification for exemption

The applicant justifies the request for exemption based on technical criteria:

- Substitution is currently technically not feasible, no glass recipes are known that result in an acceptable transmission spectrum.
- Earlier efforts to substitute Pb have led to a published patent, WO 96/21629, published 18 July 1996, the implementation of which could not be realised up to now, due to a number of technical reasons.
- Earlier patented lead-free BLB glass appeared to yield a very large lamp emission reduction over time. This would result in an unacceptably short lamp life.

As reaction to additional questions by the consultants ELCF provided further information. According to the applicant in the mean time, substantial technical progress has been achieved, which makes it possible to decide on the technical feasibility in 2006.

5.3.3 Final recommendation

Information delivered by the applicant is complete and comprehensible. Basically this exemption request should be granted according to Article 5 (1) b, as at the moment no substitutes are existent providing the functionality. However the exemption should be restricted for the time period the applicant mentioned to be necessary to decide on the technical feasibility.

Against this background we suggest the following wording:

"Lead oxide in the glass envelope of Black Light Blue (BLB) lamps, exemption until 31/12/2006."

5.4 PbO (lead in seal frit) used for making BLU (Back Light Unit Lamp) for LCD televisions – Samsung (set 2 request No. 9)

5.4.1 Description of requested exemption

Samsung Corning Co. Ltd requests an exemption for the use of lead oxide as seal frit used for producing Black Light Unit (BLU) lamps. These kinds of lamps are used as a light source called Backlight Unit (BLU) for Liquid Crystal Displays (LCD). One newly-designed kind of BLU are the flat fluorescent lamps (FFL) which make it possible to use only one flat fluorescent lamp driven by one driving circuit in the BLU for large-size LCD panels instead of up to 20 lamps and as many driving circuits as light source for one 32" LCD panel.

According to an assumption of the applicant the total amount of lead oxide used for this application accounts for about 10.000 kg p.a.

The requested exemption described here is nearly in full accordance to the request of the European Lamp Companies Federation (ELCF) on "mercury free flat panel lamp assembled by using lead containing glass solder" (set 1 request 16; final recommendation see report 2 section 5.8).

5.4.2 Summary of justification for exemption

The request for exemption is based on technical criteria as well as on environmental/toxicological criteria:

- A number of possible substitutes for PbO as sinter material was evaluated (bismuth glass, zinc borate glass, tin phosphate glass). None of these potential substitutes met the required properties being softening temperature (adjustable between 350 to 600 °C), adhesive strength, thermal expansion coefficient (similar to glass substrate) and chemical stability.
- Possible substitutes require higher calcination temperatures to improve the sintering characteristics leading to additional energy consumption during production.