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

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lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCD).

Taking this into account we recommend not continuing the existing exemption. In order to ensure the technical implementation a transition period of 18 months after publication (mid 2011) is proposed.

4.26.4 References

[1] Gensch et al. 2005; Adaptation to scientific and technical progress under Directive 2002/95/EC. Monthly report 4, final version. Freiburg, 20 December 2005

[2] Joint Industry contribution to the ÖKO Institute's consultation on the Actual Exemptions from the RoHS Directive. Brussels, 01 April 2008

[3] RoHS Revision: Exemption 20. E-mail Dr. Georg Niedermeier, June 11, 2008

[4] Further ELC input to RoHS Exemptions 5, 7a, 16, 17, 18, 19, 20, 26. Brussels, 08 August 2008

4.27 Exemption No. 21

"Lead and cadmium in printing inks for the application of enamels on borosilicate glass"

4.27.1 Description of exemption

The exemption came into force on 12 October 2006 based on the recommendation by Öko-Institut and Fraunhofer IZM to grant the exemption [1]. However, it was recommended to review this exemption including the following aspects:

- Do ESGA and ELCF represent all relevant stakeholders in this field of application or which other relevant stakeholders can be identified?
- Can all relevant stakeholders agree on the interpretation of glass marked with lead (and cadmium) containing inks as being a homogeneous material? Is this possibly valid only for lead or cadmium?
- Can cadmium-free printing inks also be used on borosilicate glass for applications ESGA initially requested an exemption for (e.g. coffee jugs)?

If an exemption appears to be further needed, it should be checked with stakeholders whether borosilicate and soda lime glass applications concerned – for which substitution is not feasible – can be listed exhaustively in order to narrow down the scope of the exemption.

Since the technological context of this application has not changed since, the general description is reproduced from [1] and updated with [2]:

The European Special Glass Association (ESGA) on behalf of the Duran Group had requested an exemption for the use of lead and cadmium in enamels on borosilicate glass. The substances are contained in inks printed on borosilicate glass in certain electrical and electronic equipment (for the major part on jugs for coffee makers and water kettles). The ink is used to print scales, warnings and logos on the glass.

The ink being considered a homogenous material contains between 37% and 48% PbO by weight and up to 11% CdO by weight. For the overall European market this leads to an annual consumption of 100 kg Pb and 2,6 kg Cd.

The lead in the ink is responsible for lowering the melting point, thus positively influencing the fusion with the glass matrix, and improving chemical resistance. As part of customer specification and consumer safety, the readability of markings in the case of coffee makers and water kettles has to be guaranteed for 400 dish-washer-cycles. Cadmium together with the lead gives the enamel a good resistance against temperature, acids and alkalis as they are used in domestic cleansers. Cadmium is thus also necessary to guarantee long-lasting markings.

4.27.2 Justification by stakeholders

The former applicant had argued that there is no substitute for lead and/or cadmium in the ink for printing markings on borosilicate glass and Duran has supported this with a new stakeholder comment in the context of the current evaluation [2]. There are lead-free alternatives available but these cannot guarantee the resistance to temperature, acids or alkalis. Since the relevant application is used for products that are regularly cleaned in dish-washers the applicant states that no lead-free alternative can be used. Concerning the low melting point function of lead the applicant states that there is no alternative lead-free ink that can be used on borosilicate glass.

In order to clarify potential substitutes the following questions were raised during the initial evaluation as described in [1]:

- Is it possible to mark the glass with etching/engraving instead of printing?
- Is it possible to use another kind of glass which does not need lead to lower the melting point of the ink?
- Is it possible to eliminate the marking on the glass completely?

The former applicant justifies the necessity of an exemption continuation as follows [1] [2]:

- It is technically possible to substitute marked glass by non-marked glass. However, marking is necessary for the functionality of the application and/or consumer safety.
- Marking the glass with etching/engraving does not seem to be technically feasible due to cracks and not sufficient resistance to acids and alkalis.
- Substituting the borosilicate glass by another kind of glass which would not require a low-melting point ink does not seem to be feasible since the glass has to meet specific

characteristics (e.g. resistance to heat, fast changes between hot and cold filling) which are not met by other glass types.

There is the theoretical possibility to use lead-free printing inks using other heavy metals such as bismuth. Trials carried out by the applicant did not lead to useful results: the lead containing ink passes more than 200 cycles in the dishwasher while the bismuth containing one passes only 50.

Duran itself is purchasing the inks in order to print them onto the glass. It claims that suppliers have no economic interest in developing lead and/or cadmium-free printing inks since the application on borosilicate glass is a niche market.

4.27.3 Critical review and recommendation

No stakeholder comments were received during the consultation period. Thus the questions which were identified formerly by Öko-Institut and Fraunhofer IZM [1] have not been addressed in depth as initially expected. Upon direct request the former applicant has sent a stakeholder comment. Furthermore ELC confirmed that their position recorded in the previous report [3] is still valid. According ELC, lead is used in printing inks on parts of the outer surface of lamps (e.g. fluorescent lamps). These markings are essential for product identification, as requested by safety standards. The marking has several functions, during entire life cycle:

- To identify the producer,
- to identify lamp type and wattage, which is relevant for safety, correct lamp replacement and recycling,
- CE, WEEE marking.

In this context it must be noted that the glass type being used for lamps are soda lime glasses, which are not covered by the existing wording of the exemption.

Independent of the situation that there is not much general interest with regard to this exemption it appears that substitutes fulfilling the criteria for durability of the marking do not seem to exist.

It is therefore recommended to continue the existing exemption as it is until the next review period, but to adjust the wording in order to ensure legal certainty (for details see [3]):

““Lead and cadmium in printing inks for the application of enamel on glasses, such as borosilicate and soda lime glasses.”

4.27.3.1 Transition period and expiry date

Since the exemption is recommended to be continued no transition period is necessary. Assuming an official publication of an amended RoHS Annex by end 2009, the expiry date is

recommended to be set four years later at 31 July 2014. Setting an expiry date will increase the incentive for research into lead and cadmium-free alternatives.

4.27.3.2 Spare parts

No spare parts clause is necessary at this stage since the exemption remains unchanged. However, once the exemption will have expired, a clause should be added that spare parts for what used to be applications covered by exemption 21 are exempted from substance use restrictions.

4.27.3.3 Category 8&9

There are no related category 8&9 applications known to the consultant. Since the exemption remains unchanged there are no effects onto products belonging to these categories.

4.27.4 References

[1] Gensch et al. 2005; Adaptation to scientific and technical progress under Directive 2002/95/EC. Monthly report 3, final version. Freiburg, 21 November 2005

[2] Stakeholder comment by Duran Group from 08 September 2008

[3] Öko-Institut e.V., Fraunhofer IZM: Adaptation to Scientific and Technical Progress under Directive 2002/95/EC; final report; document "Final_Report_RoHS-Exemptions-October_2007.pdf"

4.28 Exemption No. 22

"Lead as impurity in RIG (rare earth iron garnet) Faraday rotators used for fibre optic communication systems"

JEITA (Japan Electronics & Information Technology Industries Association) on behalf of NEC Corporation and Murata Manufacturing Co., Ltd and SUMITOMO METAL MINING CO.,LTD. requested this exemption for lead in optical isolators in the first stakeholder consultation on exemption requests in 2004/5 as exemption request no. 10 (http://ec.europa.eu/environment/waste/rohs_consult.htm). The exemption was recommended to be granted (Öko-Institut Report 2006; Annex 1 Monthly Report 3). After a stakeholder (Integrated Photonics) had submitted evidence that lead-free RIG Faraday rotators are available on the market, the originally positive recommendation was cancelled and it was then recommended not to grant this exemption (Öko-Institut Report 2006; Final Report). Unfortunately, by the time the 2006 final report was published, the initial positive recommendation given in monthly report 3 (Öko-Institut Report 2006; Annex 1 Monthly Report 3) had already been adopted by Member States and was then published in Commission Decision 2006/691/EC.