

For section: European requirements

EC announces 7th RoHS exemption stakeholder consultation

The RoHS Directive allows exemptions for the use of the restricted substances to be provided where there are substantive technical reasons. The EC process requires that all exemption requests should be made known to stakeholders to provide input for or against. The EC has announced the latest review with a deadline for input of 10 August 2007. Submissions should be non confidential and need to comply with the requirements of Article 5.1(b), i.e. based only on scientific, technical, environmental, health and safety reasons. Hence, issues of cost cannot be considered.

Seven exemption requests are being considered:

1. Lead in silver rings on the exterior lamp surface of induction-type fluorescent lamps;

Requestor: *European Lamp Federation*

Two exemptions are requested:

- A) An extension of Exemption 21 (lead and cadmium in printing inks for the application of enamels on borosilicate glass) to “Lead and cadmium in printing inks for the application of enamels on glass like borosilicate or soda-lime glass.”

Basis: Lead borate based inks is used to mark the external surfaces of various types of glass lamps because it is very hard wearing and lasts the life of the bulb (this is a legal requirement). The request is to broaden an early exemption to include a wider range of glass substrates. Substitution has been possible for all but incandescent and long life fluorescent lamps. No evidence is provided on research on substitutes though this may be available and no possible date when alternatives might be available is given.

- B) “Lead in silver rings on the exterior lamp surface of induction-type fluorescent lamps”

Basis: These lamps are intended for very long life (over 100,000 hours) and use a silver ink which contains 7% lead as a glass binder to produce an external conduction ring to meet EMI requirements. The PbO in the ink melts and binds the silver to the glass lamp which must last the whole life of the bulb under temperature cycling. ELF states that substitutes, copper paste and a “lead-free marking ink cannot cope with the temperature or are insufficiently conductive shortening product life although substitutes may be available by 2009. No supporting technical documents are published with the request though they may be available.

2. Mercury in plasma displays;

Requestor: *Babcock Inc.* (supplier of flat panel displays)

Basis: Mercury is required in the gas to reduce cathode sputtering. Without mercury, Babcock claim, the lifetime is a few hours rather than 200,000 hours. The technical basis is similar to that of existing exemptions 1 to 4. Work with Du Pont has so far yielded lifetimes of only 20,000 hours. This request was previously submitted as request 23 in March 2006 and was going to be recommended for granting but Öko’s contract expired before a wording could be proposed. Interestingly Babcock has not resubmitted its previous request for an exemption for lead oxide in the frit seal which implies they have found an alternative. This may have implications for existing exemptions 20, 25 and 26.



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3. Cadmium in Photocells for accurate control of lighting equipment;

Requestor: *Silonex* (manufacturer of optoelectronic devices)

Basis: Perkin Elmer previously had an exemption request for cadmium in photocells turned down. A related request from Marshall Amplification is currently under consideration. Macron, another manufacturer of photocells/optocouplers has incorrectly stated that its devices are RoHS compliant and so there is no need for this exemption. Macron photocells have been tested by ERA and found to contain a mechanically disjoinable layer containing >0.01% cadmium (actually ~40% Cd). Cadmium based photocells provide a response similar to the human eye unlike silicon based devices. As such they can dispense with additional electronics and special filters and allow public street lighting to be turned on and off only when needed by road users to prevent accidents. This enables a significant reduction in energy use and carbon emissions. Silonex provides significant technical evidence to support its case for an exemption “cadmium in human eye sensitive visible light sensors for measurement of light levels for control of ambient lighting”.

4. Cadmium-based photo-resistors used in professional audio equipment;

Requestor: *Sound Devices* (professional audio equipment manufacturer)

Basis: This request is similar to a previous request for cadmium sulphide photocells and Marshall Amplification’s request for cadmium in opto-couplers (opto-isolator) that is currently being reviewed by the Öko Institut. This application is for professional high quality analogue portable equipment. Using CdS reduces weight by avoiding additional circuitry and lowers the power required extending battery life. Weight of portable equipment is a serious health issue and Sound Devices point out that it was not unusual for Location Audio Engineers to be forced to retire early due to back problems until the current lightweight products became available. Nevertheless, they foresee that they can design out the opto isolator if they are given a 3 year grace period to develop this (during which only 4g of cadmium would be used!). Even so they estimate that any substitute will be bigger, heavier and consume more power.

5. RELOCK FUSE, Model X-09 - “Lead & Cadmium in a mechanical fuse used in products for protection of sensitive information”;

Requestor: *Kaba Mas* (electronic security lock manufacturer)

Basis: The lock contains a low melting point fuse made from Wood’s metal (28% lead, 9% cadmium) which is designed to melt if the safe is attacked. When the alloy melts, it allows a bolt to close stopping the safe being opened. They state that there are no substitutes available but do not present any evidence to support this claim. Wood’s metal melts at 71°C which is unusual as it will melt in boiling water. The Commission’s consultants who review exemption requests will expect to see research results to confirm that no substitutes exist. In fact an alloy with 66.3%In 33.7Bi melts at 72°C¹. As Kaba Mas have not provided evidence that supports their request, it is not known whether this or any other potential materials could be used. The Commission’s consultants would expect to see test results from the evaluation of potential substitutes.

¹ Indium Corporation website includes alloy data <http://www.indium.com/products/pbfree/metallalloylist.php>



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6. High voltage diodes in glass housings;

Requestor: *Vishay Semiconductor (Austria)* (electronic component manufacturer)

Basis: These devices use a zinc borate glass containing 2.5% lead. Pure tin plating is used and in one stage of the production process lead from the glass is dissolved and contaminates the tin coating of the terminations so that the resultant tin contains up to 0.3% lead. The request assumes that the lead in glass is already exempt as it is covered by exemption 5 (lead in glass of electronic components) which seems to be correct and the problem is the dissolved lead in the plating. Vishay point out quite reasonably that the total amount of lead does not change before and after plating and it all comes from the glass which may be seen to be exempt. They state that substitution of the glass is not possible due to the electrical and mechanical performance required and experiments to prevent the glass dissolving have been unsuccessful. No test results or other evidence is provided to support the request although it may exist. One question that the Commission's consultants should ask is could nickel/gold termination coatings be used instead of tin and if so will this be contaminated by lead?

7. Cadmium and cadmium oxide in thick film pastes used on beryllium oxide substrates;

Requestor: *Apex Microtechnology* (electronic amplifier and IC manufacturer)

Basis: This is a resubmission of a previous request which was not considered but with additional data. The cadmium is needed as a component of thick film pastes to ensure good long term bonding to the BeO substrate and to gold bonding wires at high power (high temperature). Several RoHS compliant substitutes have been tested but all fail after extended exposure to high temperatures (this simulates aging), a condition under which these parts must operate. Data is provided on these tests. RoHS compliant thick film pastes are suitable for use on the more common alumina substrates used at lower temperatures but much less development work has been carried out with beryllium oxide substrates.

For those considering requesting an exemption these submissions are instructive. Whilst the case may be good for all of these requests only 3 and 7 present solid evidence of research work having been done. It is to be hoped that the evaluators will seek further evidence where it is not immediately available. Any interested stakeholders should submit their views, experience and any test results to the Commission by 10 August 2007.

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The consultation is available at http://ec.europa.eu/environment/waste/weee/events_en.htm. Send responses to ENV-RoHS@ec.europa.eu or by post to: European Commission DG Environment, Unit G4 – Consultation Directive 2002/95/EC, B-1049 Brussels, Belgium.



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