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Fraunhofer Institut Zuverlässigkeit und Mikrointegration

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

Exemption request No. 2

"Lead and Cadmium as components of the glazes and colour used to glaze or decorate lamp bases, lamp carriers or clocks"

Email and checklist as submitted by Cérame-Unie

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From: Christoph Pausch [pausch@cerameunie.eu]
Sent: lundi 8 octobre 2007 16:41
To: PASSERA Anna (ENV)
Subject: ROHS Lamp Bases and Clocks

Attachments: RoHS Check list- exemptions requests1 (2).doc

Dear Ms. Passera,

Please find enclosed the preliminary submission for an exemption. Please let us know if you should need further information.

Thank you very much and best regards,

Christoph Pausch, Cérame-Unie

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EUROPEAN COMMISSION
DIRECTORATE-GENERAL
ENVIRONMENT
ENV.G - Sustainable Development & Integration
ENV.G.4 - Sustainable Production & Consumption

DIRECTIVE 2002/95/EC ON THE RESTRICTION OF THE USE OF CERTAIN HAZARDOUS SUBSTANCES IN ELECTRICAL AND ELECTRONIC EQUIPMENT (RoHS).

CHECK LIST FOR REQUESTS FOR ADDITIONAL EXEMPTIONS

Industry has sent to the Commission's services a number of requests for exemptions from the requirements of the RoHS Directive that are additional to those currently covered by the study and the stakeholder consultation. In most cases these are not substantiated by scientific and technical evidence. The proposed check-list will enable the Technical Adaptation Committee (TAC) to carry out a first screening of the requests received. Proposals that successfully pass the screening process will then be considered for a possible exemption.

Article 4(1) of Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment[1] provides 'that from 1 July 2006, new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, PBB or PBDE.' The Annex to the Directive lists a limited number of applications of lead, mercury, cadmium and hexavalent chromium, which are exempted from the requirements of Article 4(1).

Adaptation to scientific and technical progress is provided for under Article 5 of the Directive. Pursuant to Article 5(1): "Any amendments which are necessary in order to adapt the Annex to scientific and technical progress for the following purposes shall be adopted in accordance with the procedure referred to in Article 7(2):"

Article 5(1)(b) allows the exempting of materials and components of electrical and electronic equipment from Article 4(1) if their elimination or substitution via design changes or materials and components which do not require any of the materials or substances referred to therein is technically or scientifically impracticable, or where the negative environmental, health and/or consumer safety impacts caused by substitution are likely to outweigh the environmental, health and/or consumer safety benefits thereof;

In order to allow the TAC to consider submissions for additional exemptions, the information in Table I should be provided as a first step. The request for submissions should fulfil the criteria of Article 5(1)(b). The information provided should be supported, as far as possible, with relevant technical and scientific evidence.

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[1] OJ L 37, 13.2.2003, p. 19

TABLE I – CHECK LIST

PROPOSALS FOR FURTHER EXEMPTIONS FROM THE REQUIREMENTS OF ARTICLE 4(1) OF DIRECTIVE 2002/95/EC FOR SPECIFIC APPLICATIONS OF LEAD, MERCURY, CADMIUM, HEXAVALENT CHROMIUM.

Criteria	Information Please provide supporting technical and scientific evidence
1. Please describe the material / component of the electrical and electronic equipment that contains the hazardous substance.	Ceramic bases are used for table lamps and similar applications. Ceramic bases are used also for clocks. In both case the base or carrier is within the apparent scope RoHS. In the case of lamp bases it is luminaires that are covered by the Directive and the definition of a luminaires is understood to include the ceramic base or carrier. In the case of clocks the ceramic base into which the clock mechanism is inserted is covered but there is no definition which makes it clear why the mechanism and the carrier are regarded as a single homogeneous unit. In fact the alternative is almost the case. The bulb holder, which is the actual electrical component of a lamp is normally inserted or screwed into the base and can be removed mechanically by the same means. In the case of almost all modern clocks the quartz mechanisms is self contained and inserted into the carrier with finger pressure and can be removed in a similar manner
Please indicate the type and quantity of the hazardous substance used in the homogenous material. Please indicate the quantity of the substance in absolute numbers and in percentage by weight in homogenous material.	Lead and Cadmium are components of the glazes and colour used to glaze or decorate the lamp bases or carriers. Lead is used in glazes and colours. The use of cadmium is much more marginal and is predominantly used only to provide a red colour. It is impossible to quote absolute number because of the variability of the articles in question. However typical %'s can be given for the components. Glaze or Decoration as a % of

	total weight 1% Glaze & Decoration <15% Pb by weight Lamp or Clock Base overall <10% Pb by weight The proportions of Cadmium where it is used are much smaller. Lead is used only in an insoluble form as lead bisilicate or encapsulated in a frit (a glassy compound). Cadmium is used only in an encapsulated form (with Zirconia). In all cases the materials are fired with or onto the ceramic base. Essentially the glaze forms a glassy phase on the exterior surface(s) of the ceramic base. Similarly the firing process incorporates the decoration or colours into the glassy phase. The result is an extremely stable resistant insoluble and permanent cover or finish to the ceramic article. Only severe abrasion or chemical attack can cause even marginal release of any of the components. The ceramic bases used for Lamp Bases or Clocks are produced in exactly the same ways as Ceramic Tableware to which the most stringent standards apply originally as Directive 84/500 EC revised as 2005/31 EC. The Directive sets the limits for Lead and Cadmium release for articles in contact with food where any human exposure would otherwise be an issue.
Please indicate the functionality of the substance in the material of the equipment.	The ceramic items provide a stable and inert base for both lamps and clocks. In addition the glaze and decoration provide the ability to match or tone with environments in which they are placed. Without that ability the Lamp Base or Clocks themselves would have no purpose. There are other purposes or functions in the case of a Lamp Base. The Ceramic

Please also provide an estimate of the annual quantities of the hazardous substance used in this particular application.	base and components prove by far the highest insulating properties of any alternative Lamp Base. The ceramic insulators used for electrical transmission and switching are essential the same as the ceramic article under discussion. None of the alternatives would provide the same level of electrical insulation, water or moisture resistance, or, durability. Finally there is a design and artistic component of the articles which is part of their functionality and is provided by the use of the various components. The total quantity of lead used in the Manufacture of Lamp Base and Carriers for clocks is probably less than 5000 tonnes per for the whole of Europe. Similarly the consumption of Cadmium would be a very small fraction of that figure.
2. Please explain why the elimination or substitution of the hazardous substance via design changes or materials and components is currently technically or scientifically impracticable.	It is impossible at this stage to totally eliminate the relatively smaller quantities of lead and cadmium used. Unleaded systems often result in less durability, potentially higher releases or exposures and if anything, higher risk. The Industry has and continues to work towards unleaded systems for glazes and colours without diminution of the other essential properties.
3. Please indicate if the negative environmental, health and/or consumer safety impacts caused by substitution are likely to outweigh the environmental, health and/or consumer safety benefits. **If existing, please refer to relevant studies on negative impacts caused by substitution.**	Substitution would create a situation in which the benefits outlined above would be lost. Most if not all of the alternatives would have the same or similar issues in relation to the components used e.g. any other metal or decorated substitute. More importantly there are almost no environmental or consumer benefits to be gained by the application of RoHS to Ceramic Lamp or Clock Bases. As already stated the Bases are manufactured to the same standards as conventional tableware. The bases are also less likely to enter the waste chain. The Ceramic Bases are likely to be more valuable than the

	electrical lamp fitting of the clock mechanism by a factor of 10 or more. As a result the consumer would be much more likely to replace the true electrical or electronic components than discard all of the unit essentially to landfill. Even if that were the case it should be remembered that encapsulation in ceramic or glassy compounds is regarded as almost the safest least risk and durable form of disposal and is even used for radioactive waste etc. Almost any substation would be likely to be more negative.
4. Please indicate if feasible substitutes currently exist in an industrial and/or commercial scale. **Please indicate the possibilities and/or the status for the development of substitutes and indicate if these substitutes will be available by 1 July 2006 or at a later stage.**	None, almost any form of metal or other material would fail to provide the same protection or properties. Lead Crystal bases are a parallel product but not a universal alternate. Lead Crystal has many of the same properties. It should be noted that Lead Crystal Lamp and Clock bases have already been granted exemption under 2008/690/E.C. It would be discriminatory and a distortion of trade and competition if the same exemption was not given to Ceramic bases as a competing product. Not possible as above
5. Please indicate if any current restrictions apply to such substitutes. **If yes, please quote the exact title of the appropriate legislation/regulation.**	
6. Please indicate the costs and benefits and advantages and disadvantages of such substitutes.If existing, please refer to relevant studies on costs and benefits of such substitutes.	
7. Please provide any other relevant	It should be noted that the European

information that would support your application for an additional exemption.	Waste Catalogue defines fired ceramic waste as non-hazardous, recognising the way in which the constituents are bound.