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<br><br>Please provide supporting technical and scientific evidence |
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| **1. Please describe the material / component of the electrical and electronic equipment that contains the hazardous substance.**<br><br>**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.**<br><br>**Please indicate the functionality of the substance in the material of the equipment.**<br><br>**Please also provide an estimate of the annual quantities of the hazardous substance used in this particular application.** | Eutectic Sn63/Pb37 solder<br><br>Lead (Pb)<br><br>Quantity in Absolute numbers – 37g per 100g solder<br><br>Quantity in Percentage 37%<br><br>Used to make mechanical/electrical connections in circuit boards and other parts of EEE. Used as a plating on component connections.<br><br>Globally 0.49% of total annual lead consumption *(N. –C Lee "Lead Free Soldering – Where is the world Going," Advancing Microelectronics, September/October, 1999, p29)* |
| **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.** | No issues as part of this submission. |
| **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.** | RM Sommer Consulting Ltd believes that the industry standard eutectic Sn63/Pb37 solder should be exempt from the substance restrictions of article 4(1). The grounds of this submission for exemption lie in article 5(1)(b). It is the view of RM Sommer Consulting Ltd |

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| **If existing, please refer to relevant studies on negative impacts caused by substitution.** | that the negative environmental and/or health impact of the alternatives are likely to outweigh the environmental and/or health benefits.<br><br>The supporting evidence for this is as follows:<br><br>• The environmental impact study by Ed Smith and Kristine Swanger of K*Tec Electronics concluded "The data from these experiments shows that lead free solders leach at levels that would cause them to be classified as a hazardous waste". [1]<br><br>• The paper "Is this Ban Really Necessary? A Critical Investigation of the CRT Ban: by Clark Akatiff [2] details an investigation of the Palo Alto landfill that has existed since the 1930s. It has an estimated 20,000 –100,000 CRTs disposed there from 1982 to 2002. These CRTs are part of televisions and computer monitors, both of which have a high level of associated electronics using eutectic Sn63Pb37 solder. Additionally, given the age and type of equipment the electronics would be predominantly through-hole technology which uses x10+ more solder per joint than modern Surface Mount Technology. This makes this study representative of worst case for EEE waste. The lead content of the leachate pumped out contained, at worst case 1 part per 100 Million – 500 times lower than the EPA actionable level. The lead levels from the 10 monitoring wells ranged from undetectable to 1.3 parts per 100 Million – 1/400$^{th}$ of the EPA actionable level worst case.<br><br>• Dr Laura Turbini, from the Centre for Microelectronic Assembly and Packaging provides a well rounded argument supported by a plethora of data and like minded research in her |

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| | presentation "The Real Environmental Cost of Lead Free Soldering"[3] |
| **4. Please indicate if feasible substitutes currently exist in an industrial and/or commercial scale.**<br><br>**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.** | No known substitutes that provide a robust technical solution combined with a positive environmental impact. |
| **5. Please indicate if any current restrictions apply to such substitutes.**<br><br>**If yes, please quote the exact title of the appropriate legislation/regulation.** | Not applicable based up the reply to point 4. |
| **6. Please indicate the costs and benefits and advantages and disadvantages of such substitutes.**<br><br>**If existing, please refer to relevant studies on costs and benefits of such substitutes.** | Not applicable based up the reply to point 4. |
| **7. Please provide any other relevant information that would support your application for an additional exemption.** | A few common sense points that have come from our research<br><br>• If lead does leach in its' pure form why do lead flashings on roofs last for 100+ years?<br><br>• If lead does leach from pure lead then surely there is a far greater issue with leaching from balancing weights on car wheels.<br><br>• Lead is found in open cast mines in Scotland and the peak district – is the runoff from naturally occurring lead in the ground (galena) polluting British waterways?<br><br>• If lead leaches from glass surely there is an issue with lead crystal drinking glasses – especially if used with wine? (lead leaches more with |

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| | an acidic ph)<br><br>• Of particular concern is our research has highlighted a high level of toxicity with silver which is in common use for cutlery and tableware. Given the body of evidence contained in the papers referenced in this submission we are of the opinion that this urgently warrants further investigation, not only in usage but also in disposal paths.<br><br>RM Sommer Consulting Ltd has no issue with the fact that lead, in certain applications is highly detrimental to human health, the main applications being lead in petrol and lead in deteriorating paint. The issue in both of these applications is the pathway into the body which is inhalation and ingestion respectively. Lead does not leach significantly in water, and the little that does quickly recombines with other elements, and then has little or no bioavailability. Hence groundwater pollution is not an issue as backed up by the Palo Alto study [3]. Given that any possible ingestion and inhalation of solder is confined to occupational exposure and should be managed in a safe manner in the work place we can see no grounds for restricting the use of lead in solder applications.<br><br>[1] http://leadfree.ipc.org/files/LF_3-4.pdf<br><br>[2] http://www.westp2net.org/hub/hub36/Is_this_ban_necessary_CRT_.pdf<br><br>[3] http://www.cmap.ca/open/Lead-Free%20May%201%202002A.pdf |