Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

Fraunhofer Institut Zuverlässigkeit und Mikrointegration

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

Stakeholder contribution for exemption 14

"Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80 % and less than 85 % by weight"

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by Julian Lageard,
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General questionnaire

1. For which substance(s) or compound(s) should the requested exemption be valid?	Intel is capable of 100% lead-free pin attachment soldering process for its microprocessors.
2. What is the application in which the substance/compound is used for and what is its specific technical function?	
3. What is the specific (technical) function of the substance/compound in this application?	
4. Please justify why this application falls under the scope of the RoHS Directive (e.g. is it a finished product?	
- Is it a fixed installation?	
- What category of the WEEE Directive does it belong to?).	
5. What is the amount (in absolute number and in percentage by weight) of the substance/compound in:	
i) the homogeneous material[1]	
ii) the application, and	
iii) total EU annually for RoHS relevant applications?	
6. Please check and justify why the application you request an exemption for does not overlap with already existing exemptions respectively does not overlap with exemption requests covered by previous consultations.	
7. Please provide an unambiguous wording for the (requested) exemption.	
8. Please justify your contribution according to Article 5 (1) (b) RoHS Directive whereas:	
o Substitution of concerned hazardous substances via materials and components not containing these is technically or scientifically either practicable or impracticable;	
o Elimination or substitution of	

concerned hazardous substances via design changes is technically or scientifically either practicable or impracticable;	Intel uses lead-free pin attachment solder for pin grid array CPU since 1999. This includes our 45nm 100% lead-free CPU Penryn PGA and its earlier generation products that contained lead in first level interconnects. Currently, the Penryn PGA products are at ramp to HVM stage. There is no high volume manufacturing issue, to our knowledge.
o Negative environmental, health and/or consumer safety impacts caused by substitution are either likely or unlikely to outweigh environmental, health and/or consumer safety benefits thereof (If existing, please refer to relevant studies on negative or positive impacts caused by substitution).	Intel uses lead-free pin attachment solder for pin grid array CPU since 1999. This includes our 45nm 100% lead-free CPU Penryn PGA and its earlier generation products that contained lead in first level interconnects. Currently, the Penryn PGA products are at ramp to HVM stage. There is no high volume manufacturing issue, to our knowledge.
9. Please provide sound data/evidence on why substitution / elimination is either practicable or impracticable (e.g. what research has been done, what was the outcome, is there a timeline for possible substitutes, why is the substance and its function in the application indispensable or not, is there available economic data on the possible substitutes, where relevant, etc.).	Intel uses lead-free pin attachment solder for pin grid array CPU since 1999. This includes our 45nm 100% lead-free CPU Penryn PGA and its earlier generation products that contained lead in first level interconnects. Currently, the Penryn PGA products are at ramp to HVM stage. There is no high volume manufacturing issue, to our knowledge. For the detailed work done to enable lead-free PGA, pls see session 8.
10. Please also indicate if feasible substitutes currently exist in an industrial and/or commercial scale for similar use.	Intel uses lead-free pin attachment solder for pin grid array CPU since 1999. This includes our 45nm 100% lead-free CPU Penryn PGA and its earlier generation products that contained lead in first level interconnects. Currently, the Penryn PGA products are at ramp to HVM stage. There is no high volume manufacturing issue, to our knowledge.
11. Please indicate the possibilities and/or the status for the development of substitutes and indicate if these substitutes were available by 1 July 2006 or at a later stage.	
12. Please indicate if any current restrictions apply to such substitutes. If yes, please quote the exact title of the appropriate legislation/regulation.	
13. Please indicate benefits / advantages and disadvantages of such substitutes.	
14. Please state whether there are overlapping issues with other relevant legislation such as e.g. the ELV Directive that should be taken into account.	

15. If a transition period between the publication of an amended Annex is needed or seems appropriate, please state how long this period should be for the specific application concerned.	
16. Additional comments	

Specific questions exemption 14

"Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight"

The following specific questions should be answered in your stakeholder contribution if you support exemption 15 to be continued / amended / discontinued:

1. Please state the **amount of lead** used per application, the lead content in the homogeneous material, the annual production volume as well as the number of applications related to exemption 14 put on the EU market annually.	
2. Please explain the status of lead-free material use in this application (Where is substitution feasible? Where is substitution in progress? Where has research resulted in an unfeasibility of substitution? …).	Intel uses lead-free pin attachment solder for pin grid array CPU since 1999. This includes our 45nm 100% lead-free CPU Penryn PGA and its earlier generation products that contained lead in first level interconnects. Currently, the Penryn PGA products are at ramp to HVM stage. There is no high volume manufacturing issue, to our knowledge. For the detailed work done to enable lead-free PGA, pls see session 8.
3. The previous evaluation in 2004 stated that design changes would make this exemption obsolete by 2010. The exemption should therefore be limited to 31 December 2009. Is such a **phase out** still possible until the end of 2009? If the exemption is needed beyond 2009, please justify and provide a detailed **roadmap** with activities, milestones and timelines towards the replacement of lead in this application. Name an **expiry date** that you think is technologically feasible for industry.	Yes.