Stakeholder consultation on exemptions from the substance restrictions in electrical and electronic equipment (RoHS Directive) running from 26.06.2012 to 04.09.2012

Results previous evaluation for exemption request 3 “Lead in solders for Positron Emission Tomography detectors and data acquisition units installed in Magnetic Resonance Imaging equipment” and exemption request 4 “Lead in solders used in mobile medical equipment”

(Excerpt from Öko-Institut Report 2006, ZIP Annex 1, Monthly Report 7)

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Critical review on data and information (given by applicant or other parties)

The supporting document from Stannol mentions several alternatives that are in line with the requirements of the RoHS Directive, but that none of them is appropriate to replace the lead and/or cadmium containing solders in this safety relevant application. So far there are no hints giving different evidence.

However, meanwhile there are some hints that competitors may have found ways to produce these power transformers in line with the requirements of the RoHS Directive. This needs some further investigations in order to make sure the competitors' products are comparable to the applicant's products.

Additionally, the applicant mentions that switched mode power transformers technologically are a RoHS compliant alternative to the AC/DC power transformers and will replace them in the next 10 years. As this technology is already available as a substitute, there is no need for an exemption for AC/DC power transformers.

Thus, the exemption request only remains relevant for AC/AC linear power transformers in the performance range of 3 – 20 W, which switched mode power transformers cannot replace. Here, the competitors' RoHS conform solutions need to be investigated further to check whether they can be produced in line with the requirements of the RoHS Directive nevertheless.

5.2.3 Final recommendation

Since the last report, the situation has changed after the consultants received some hints from competitors that they have RoHS compliant solutions for the low melting point alloys in thermofuses of linear power transformers. These hints require further investigation before a final recommendation for this exemption request is possible.

5.3 Lead alloys as electrical/mechanical solder for transducers used in high-powered professional and commercial loudspeakers – Meyer Sound (set 2 request no. 16)

5.3.1 Description of requested exemption

Substance: Lead

Function: solder

Specific application: transducers in high-powered loudspeakers

Precise wording: "Lead alloys as electrical/mechanical solder for transducers used in high-powered professional and commercial loudspeakers"

5.3.2 Summary of justification for exemption

- Criteria for justification: Main reason is reliability due to the unique conditions under which these solders are used (stress in the loudspeakers): The applicant claims, that at high acoustic power levels the transducer's solder joints are subjected to continuous extreme mechanical and thermal stresses (accelerations up to 5000 g's and voice-coil temperature peaks up to 180°C. To the applicant's knowledge, lead-based alloys are the only proven solder alloys capable of withstanding the stresses produced in transducers used for high acoustic power applications.
- Critical review on data and information (given by applicant or other parties): SFT (Norwegian Pollution Control Authority) mentioned in the stakeholder consultation: "...lead-free solders exist and have been used by other professional sound equipment manufacturers. Alternatives like mechanical connections can also be used if all other fails". "Mechanical connections" (SFT) will hardly be suitable to replace "electrical solder". The stakeholders have been asked to provide further details (applications and manufacturers) on alternatives as their comments in the stakeholder consultation have been quite vague. They have not been able to provide further details.

  Competitors have been asked to report their status of lead-free transition for this specific application, namely JVC, Yamaha, Bose and Harman. It turned out, that JVC is not serving the same market segment with their loudspeakers (no "high-powered loudspeakers", other loudspeakers are RoHS compliant). Harman points out, that they are supporting the request for exemption, but ask to have covered also Cd containing solders for transducers as this is their relevant product / application. They have been advised to submit a separate request for exemption and their issue is not dealt further with under this request.

AKG Acoustics, another loudspeaker manufacturer, supported the request for exemption within the stakeholder process, but it turned out, that they target at an exemption for loudspeakers more in general, providing a study by Elektrisola on concerns regarding leadfree soldering of enamelled copper wires – the major part in transducers of loudspeakers. As their request would broaden the scope of the initial request significantly, they have been advised also to submit a separate request for exemption instead. Bose did not respond to our request.

Yamaha confirmed to have established a RoHS compliant alternative (leadfree solder with a higher melting point) and that all their "Pro Audio" speakers to be made in or after April 2006 are supposed to be RoHS compliant. Yamaha gets the transducers from a supplier. The used solder system is a SAC (tin-silver-copper) alloy. The applicant Meyer Sound has been informed, but they explained, that their request covers a product segment not covered by Yamaha: "To our knowledge, Yamaha only markets and sells lines of loudspeakers which operate at relatively low power levels and which are appropriate for the consumer market and the so-called musical instrument (MI) market.

Generally, consumer products are less powerful than MI products, and MI products are less powerful than loudspeakers manufactured for professional and commercial applications“. Meyer Sound in their reply elaborates further on this difference it is becomes clear, that the Yamaha solution is not transferable to the “high-powered” segment.

Yamaha also pointed out a press release: “one of the world best-known high-powered speaker manufacturers, Electro Voice, has also announced their products will be lead-free and RoHS compliant on and after July 2006.” An inquiry for details at Electro Voice (EVI / Telex) lead to the following statement: They support the Meyer Sound request and point out similar problems. Telex has checked different alternatives, such as “ultra sonic welding, crimp type connections, and adhesive type bonds [for voice coil connections] without successful results“. Telex confirms, that only the high-powered product range is subject to missing alternatives due to serious reliability problems.

Upon request to give further evidence, also the applicant points to the Elektrisola study. As this study is from 2003 a request has been sent to Elektrisola, a leading manufacturer of enamelled wires, to get to know an update of the 2003 results, but Elektrisola commented, that they are not able to give a more detailed input on this specific issue.

5.3.3 Final recommendation

Based on the evidence provided by the applicant and competitors we recommend to grant an exemption with the wording proposed below.

Regarding the precise wording for an exemption a clear definition of "high-powered" is required to make a clear difference to all other loudspeakers; "professional and commercial" might not be needed in the wording, once "high-powered" is defined; as all solders are either "electrical" or "mechanical" or both the phrase "electrical/mechanical" is not needed. Upon request the applicant suggested as definition for “high-powered”: designed to operate for several hours at acoustic power levels of 125 dB SPL and above. Consequently, a precise wording would be: **“Lead alloys as solder for transducers used in high-powered (designed to operate for several hours at acoustic power levels of 125 dB SPL[1] and above) loudspeakers”.**

[1] Sound Pressure Level