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

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

Monthly Report 7

- final -

Freiburg, 21 March 2006

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1 Background and Objectives

Article 4 (1) of Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment 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).

Article 5 (1) (b) of the Directive provides that materials and components can be exempted from the substance restrictions contained in 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 outweigh the environmental, health and/or consumer safety benefits thereof.

On the basis of this provision the European Commission has received (and is still receiving) from industry additional requests for applications to be exempted from the requirements of the directive. These requests need to be evaluated in order to assess whether the request for exemption fulfil the above mentioned requirements of Article 5 (1) (b). Where the requirements are fulfilled the Commission proposes a draft decision amending the RoHS Directive.

Against this background Öko-Institut e.V. and Fraunhofer Institute for Reliability and Microintegration IZM have been commissioned by the European Commission with technical assistance for the evaluation of requests for exemptions submitted according to Article 5 (1) (b). The main objective of this technical assistance consists in a clear assessment of whether the requests for exemptions are justified in line with the requirements listed in Article 5 (1) (b).

2 General Procedure

For details on the general procedure of the evaluation of the requests for exemption please refer to the first monthly report.

3 Scope

An overview of the status quo for requests of set 2 is given in Table 1 below. After the third consultation round had ended on 28 October 2005, the requests and corresponding documents were subject to a first screening after which questions for clarification have been sent out to the applicants and other involved stakeholders. With the answers received and sometimes extensive exchange of information final recommendations were possible for most requests.

Table 1: Overview status quo requests set 2

No.	Title	Applicant	Status Quo
2	Mercury in switches	Pickering	Final recommendation given in sixth monthly report
3	Special ICs having tin-lead solder plating on leads used in professional equipment	Thomson	Close to final recommendation - final decision delayed due to overlapping LTB issues (see section 4.1)
4	Specific modular units including tin-lead solder being used in special professional equipment	Thomson	Close to final recommendation - final decision delayed due to overlapping LTB issues (see section 4.1)
5	Solders containing lead and /or cadmium for specific applications where local temperature is higher than 150 deg C and which need to work properly more than 500 hours	Schlumberger	Request has been withdrawn by applicant (see sixth monthly report)
6	Lead in solder for printed circuit boards for emergency lighting products	LIF	Request has been withdrawn by applicant (see fifth monthly report)

No.	Title	Applicant	Status Quo
7	Hexavalent chromium (Cr-VI) in chromate conversion coatings as surface treatment	Circuit Foil	Close to final recommendation – minor clarifications still necessary (see section 5.1)
8	Lead in gas sensors	Dräger	Final recommendation given in sixth monthly report
9	PbO (Lead in Seal Frit) used for making BLU (Back Light Unit Lamp) for LCD televisions	Samsung	Final recommendation given in fourth monthly report
10	Cadmium in opto-electronic components	TESLA	Final recommendation given in fifth monthly report - overlapping with request 21 set 1
11	Non-consumer mechanical power transmission systems including speed reducers and mechanical couplings which rely on electrical/electronic components for safe control and operation	FALK	Request has been withdrawn by applicant (see sixth monthly report)
12	Electrical and electronic components contained in heating ventilating and air conditioning building systems, commercial refrigeration systems and transport refrigeration systems	Carrier	Request has been withdrawn by applicant (see fifth monthly report)
13	Cadmium-bearing copper alloys	Symbol	Request has been withdrawn by applicant (see sixth monthly report)
14	Electrical/electronic components contained mobile and stationary air compressors and vacuum systems, compressed air contaminant removal systems and pneumatic contractor's air tools	Sullair	Request has been withdrawn by applicant (see sixth monthly report)
15	Electrical/electronic equipment that are: used in transport - aviation, aerospace, road, maritime, rail; installed in to the fabric of buildings – elevators, escalators, moving walks, dumb waiters, and heating, cooling and ventilation systems, and fire and security systems; used in the energy generation and transmission; used in mining and mineral processing; used for non-consumer mechanical power transmission systems; industrial process pumps and compressors; used in industrial refrigeration; and used in military applications	United Technologies	Request has been withdrawn by applicant (see fifth monthly report)

No.	Title	Applicant	Status Quo
16	Lead alloys as electrical/mechanical solder for transducers used in high-powered professional and commercial loudspeakers	Meyer Sound	Final recommendation possible (see section 5.2)
17	Cadmium oxide	INMET	Final recommendation given in fifth monthly report
18	Solder tin of the thermo fuse with a defined low melting point	Friwo	Close to final recommendation - minor clarifications still necessary
19	Lead in lead oxide glass used in plasma display panel (PDP)	KEA	Final recommendation given in fourth monthly report
20	Lead in solder on small PCB and tinned legs of primary components	e2v	Final recommendation given in fifth monthly report
21	Use of the not lead free component NEC V25 in the Memor 2000	Datalogic	Final recommendation given in fifth monthly report – overlapping with set 3 request no. 2
22	Lead used in shielding of radiation for Non Medical X-ray equipment	l3com	Request has been withdrawn by applicant (see fifth monthly report)
23	Lead based solders sealed or captured within heat-shrinkable components and devices.	SEIP	Close to final recommendation – minor clarifications still necessary

In December 2005 the fourth consultation round was launched by the Commission and closed on 11 February 2006.

Table 2 below gives an overview over the corresponding set 3 of requests for exemption.

Table 2: Overview requests set 3

No.	Title	Applicant	Status Quo
1	On-Semi MCR265-10 SCR	Helval Merca Ltd	LTB issue (see section 4.1)
2	Components NEC V55	CPG International	LTB issue (see section 4.1)
3	The use of lead in solder applications for electronic components of musical instruments having an average lifespan in excess of 10 years	Bristows	LTB issue (see section 4.1); reuse issue overlapping with set 1 request no. 20
4	Lead solder alloy in Surge protective devices (SPDs)	ZVEI	Overlapping with request no. 12 set 3
5	Inventory of Special ICs having tin-lead solder on/in leads/balls, used in specialist/professional equipment	Calibre	LTB issue (see section 4.1)
6	Lead alloys as electrical/mechanical solder for transducers used in high-powered professional and commercial loudspeakers	Hosiden Besson Ltd	Overlapping with request no. 16 set 2
7	Solder containing lead for applications where the local temperature exceeds 150 C and reliable operation for a minimum of 30,000 hours is required	ASCO	Overlapping with set 2 request no. 5
8	T in-lead solder in the manufacture of professional audio equipment	Lectrosonics Inc.	Partly LTB issue (see section 4.1)
9	Specific modular units including tin-lead solder being used in special professional equipment	Avolites Ltd	LTB issue (see section 4.1)
10	Lead in electronic vacuum tubes	Kerp	-
11	Lead in aluminium used in gas valves for domestic cooking appliances	SABAF	-
12	“8. Cadmium and its compounds in electrical contacts except for applications of one-shot operation function such as thermal links and cadmium plating except for the applications banned under Directive 91/338/EEC amending Directive 76/769/EEC relating to the restriction on the marketing and use of certain dangerous substances and preparations.”	NEC-SCHOTT	Overlapping with request no. 15 set 3
13	Lead in solder of parts recovered from gaming/amusement machines put on the market before 1/07/06 and reused for the same purpose within a manufacturer’s closed loop until July 2014	BACTA	Reuse issue overlapping with set 1 request no. 20

No.	Title	Applicant	Status Quo
14	Lead in solders in components and assemblies used in non-consumer products, provided that: - such components and assemblies were purchased or are subject to a proven last-time buy contract placed before 1 July, 2006; and - such components and assemblies are used in models of EEE that were already available on the market before 1 July 2006	AeA	LTB issue (see section 4.1)
15	"8. Cadmium plating as defined in Directive 91/338/EEC except for applications banned under Directive 91/338/EEC amending Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations."	UMICORE	Overlapping with request no. 15 set 3

After having allocated all stakeholder documents to the single requests for exemption, the check on overlapping issues has been completed. This has shown that half of set 3 requests are concerned by the so-called Last Time Buy (LTB) issue. Due to this fact the need for an in-depth analysis of all these requests arose and is being dealt with in the following section.

4 Results

It was possible to give final one more final recommendation for an open request from set 2 (no. 16). For the others minor clarifications are still necessary due to unclear communication by either the applicant or involved stakeholders or due to missing information. No final recommendation is given here since clarity needs to be reached on certain points before being able to give a final recommendation. This is especially the case for requests no. 3 and no. 4 since the possibility of overlapping with the LTB issue needs thorough assessment. T was therefore decided to postpone the final recommendation concerning these two requests until clarification of the LTB issue can be achieved.

A detailed description of the requests still open for final recommendation is given in section 5 including the description of the request for exemption (substance, function, application, wording), the summary of the justification for exemption and a critical review of available data and information as well as the final recommendation by the contractor.

4.1 Last Time Buy (LTB) issue

As can be seen in Table 2 half of set 3 requests are concerned by the so-called LTB issue. LTB is relevant for companies mostly producing specialised custom designed (most of which are also b2b products) ICs or specialised printed circuit boards assemblies in relatively small amounts. These products mostly have a very long lifetime - especially in comparison with consumer products and are subject to long design cycles. In cases were a component used in those products is not being produced anymore, these companies might take or have taken

a so-called last time buy; meaning that they order an important amount of the respective component in order to be able to secure continuous production. The problem often not only depends on hardware but also on the specific corresponding software.

Now should this component not be RoHS compliant, a large stock might exist which – according to current legislation – cannot be used for producing new equipment to be put on the market after 1 July 2006.

This is the reason why some of these companies have now requested an exemption for those LTB components in order to be able to use their stock products within new products put on the market after 1 July 2006.

One stakeholder has described a typical LTB situation as follows:

"When confronted with such an offer, equipment manufacturers usually look at several options:

1. seek an alternative supplier for the component;
2. redesign the equipment using other components or
3. do a "lifetime" or "last time buy".

An LTB is, however, rarely (if ever) the preferred option since future sales are hard to predict and stocking components for long periods is both burdensome and expensive."

In order to be able to carry out a proper evaluation, all concerned requests need to be looked at together. In view of consistency it needs to be checked whether

- the specific LTB contract was justified against the schedule of RoHS implementation (i.e. whether at the moment of LTB there really was no RoHS compliant alternative available on the market - this evaluation is not possible in practice! – and whether redesign in view of RoHS compliance was not a viable alternative to LTB);
- using LTB components would lead to non RoHS compliant products put on the market for a longer period (i.e. how long can a phase-out period be acceptable?);
- the exemption request is justified or whether the applicant is merely aiming at a sell of stocks;
- the exemption relates to a specific component in a specific application for a specific time frame or whether a "general exemption" is targeted;

This evaluation with the above described questions presents a certain challenge. Furthermore, this might only be the tip of the iceberg, since this issue specially affects SMEs facing a hard resource problem: for small companies it is sometimes nearly impossible to generate the effort in order to start a necessary redesign process in view of RoHS compliance. This is a problem which has not been foreseen in the criteria set up in Article 5 (1) (b) but which should be dealt with in the course of evaluation. This will be further analysed within the evaluation of the individual requests.

An overview of all requests concerned by the LTB issue is given in Table 3 below.

#	Who?	Request/Comment	What?	Wording	Duration exemption	Amount	Btb/btc	Status rec.
1 set 3	Helval Merca Ltd	Request	Discontinued power switching device (MCR265-10 SCR – TO220)) used as protection device in light dimming products (purchased on last time buy in 2001): lead used in Sn/Pb plating in coating of leads and tab used for making the interface between component leads and lead-free solder join to the circuit board	-	3 years	Rest of devices as from 2006 is 60.000 with 6,225mg Pb per device = 373,5g	b2b?	None yet
2 set 3	CPG	Request	NEC V55 microprocessor + COAX and TWINAX optional boards used in serial and transactional printers (last buy years ago)	Single source electronic components where last buy order has been issued before 1 July 2005 are exempted until 31 December 2006 (wording from comment made available on 8.2.2006)	End of 2006	100g in ½ year for NEC V55; 20g in ½ year for COAX+TWINAX	b2b?	None yet
9 set 3	Avolites	Request	Microcontroller by STmicroelectronics part number ST9R50 + custom video control system based around Cyrus Logic-GD5428	Specific modular units including tin-lead solder being used in special professional equipment	4 years	< 1kg over 3 years	b2b?	None yet

#	Who?	Request/Comment	What?	Wording	Duration exemption	Amount	Btb/btc	Status rec.
14 set 3	AeA	Request	Lead in solders in components and assemblies used in non-consumer products	Lead in solders in components and assemblies used in non-consumer products, provided that: • Such components and assemblies were purchased or are subject to a proven last-time buy contract placed before 1 July 2006; and • Such components and assemblies are used in models of EEE that were already available on the market before 1 July 2006	4 years? Not explicitly mentioned but phase-out of lead to be done until 2010	0,74% Pb per LTB material	b2b	None yet
5 set 3	Calibre	Request	Special ICs having tin-lead solder on/in leads/balls used in specialist/professional equipment	Inventory of Special ICs having tin-lead solder on/in leads/balls used in specialist/professional equipment	-	< 2 kg/a Pb EU? What applications? < 40% Pb in homogeneous material on the leads of the IC	b2b?	None yet
3 set 3	Allen Organ Company	Request	Lead in digital/electronic church organs	The use of lead in solder applications for electronic components used in the electronic church organ industry	10 years	5,35 kg/a	b2b + b2c	None yet

#	Who?	Request/Comment	What?	Wording	Duration exemption	Amount	Btb/btc	Status rec.
3&4 set 2	Thomson	Request (rather supply chain argument)	Special ICs and special modular units including tin-lead solder plating (on leads) used in special professional TV broadcasting equipment	Lead in tin-lead finish on leads (connecting elements) of custom designed or single source Integrated Circuits used in otherwise lead-free boards of professional broadcast equipment. The development of these ICs was completed before 19/8/05. The exemption is granted until 31/12/2009. Lead in tin-lead solder in custom designed modular units: power supplies, display modules less than 100 cm^2, non-standard connectors, in otherwise lead-free professional broadcast equipment. The development of these modular units was completed before 19/8/05. The exemption is granted until 31/12/2009.	3,5 years	600g (ICs); 1kg (modular units)	b2b	None yet

#	Who?	Request/Comment	What?	Wording	Duration exemption	Amount	Btb/btc	Status rec.
20 set 2	e2v	Request (not really LTB but rather supply chain argument)	Lead in solder on small PCB and tinned legs of primary components	Lead in solder on the printed wiring board and tinned legs of the primary component (detector module) for the use in thermal imaging cameras for 2 years.	2 years	< 1kg/a	?	Refused
21 set 2	Datalogic	Request (rather supply chain argument)	Lead in solder paste+surface treatment on component legs of specific type microprocessor (NEC V25). Component is used in certain type of handheld computer (Memor 2000) mostly used for data collection device in warehouses and retail.	Lead in solder paste and surface treatment on component legs of the NEC V25 microprocessor used in the handheld computer Memor 2000	2 years	0,25 g/PCB	Probably. b2b	Refused

5 Requests set 2 open for recommendation

The following section contains a final recommendation for requests no. 16 of set 2. Furthermore it contains the description of request no. 7 which is close to final recommendation and for which minor clarifications are still necessary.

5.1 Hexavalent chromium (Cr-VI) in chromate conversion coatings as surface treatment – Circuit Foil (set 2 request no. 7)

5.1.1 Description of requested exemption

Circuit Foil Luxembourg requests an exemption for hexavalent chromium (Cr-VI) in chromate conversion coatings as surface treatment. This treatment is used to protect copper foils in form of copper clad laminate (CCL) used for the production of printed circuit boards (PCB).

These kind of copper foils typically have a treated matte side and a brilliant shiny side. According to the applicant the protection of the treated matte side is imperative for avoiding any adverse chemical reactions between the treatment and the resin; the protection of the brilliant top side is mandatory, as any oxidation or tarnishing would negatively affect most of the subsequent process steps (like print and etch of PCB).

The conversion coatings are obtained by electrolysis out of dilute chromate containing solutions. The result of the cathodic electrodeposition is a mixture of Cr3+salt, metallic zinc and zinc salt precipitated as an extremely thin layer on the copper foil.

The main function of the coating consists in the protection of both sides of the copper foil against corrosion, whereas two types of corrosion exist (which are in fact connected):

- A slow corrosion due to natural oxidation during long-term storage of copper foil.
- An accelerated corrosion due to the lamination temperature (170 °C for FR4 prepreg, 220 °C for polyimide resins and up to 400 °C for Teflon resins) during the pressing and postbaking steps for the manufacture of the copper laminates.

Furthermore, the conversion coatings must on the one side provide an optimal conservation of copper / resin bond strength due to the resistance to chemical / thermal aggression on the copper foil treated side but on the other side also provide a very quick removal by gentle chemical etchants.

The total annual quantity in the EU was calculated from copper foil consumption in Europe for the CCL market (approx. 43,53 million m²) and from the typical residual content of < 0,002 µg/cm² of CrVI to be less than 900 g CrVI in 2004.

5.1.2 Summary of justification for exemption

The applicant justifies the request technically: no substitutes are known delivering the required protection against corrosion:

- The applicant has provided a list of different products and types tested in his facility. None of these products delivers the requested corrosion protection against thermal oxidation (2 hours stay in ventilated oven at 200 °C). Even at ambient temperature the development of corrosion after a few days storage was noticed.
- Cr3+ substitutes are often cited as a substitute for steel coating. According to the applicant the chemical reactions taking place at the interface metal / liquid with these Cr3+ substitutes do not allow to develop the type of zinc containing chemical species combination needed to achieve the maximum corrosion protection.

A number of contributions from stakeholder consultation support the request, but here it must be taken into account that these contributions do not relate to copper foils but to corrosion protection of other metals. On the other side one major manufacturer of household appliances argued not to accept this request as substitution of hexavalent chromium with Cr3+ substitutes were available. On closer examination of this argumentation this contribution is not applicable to the request of Circuit Foil too, as it relates again to corrosion protection of other metals.

5.1.3 Final recommendation

Although the applicant provides most of data and information needed to evaluate the request there are some remaining questions:

- Amount of residual CR-VI on copper foils (as there are different information given by manufacturers)
- Typical respectively critical values of peel strength depending on treatment of copper foil.
- Specific results relating to the analysis of substitutes for CR-VI

Notwithstanding, the wording of this request has to be restricted. However, according to the Copper Foil Industries Association of Japan there are more applications for the copper foil than the usage for CCL in PCB. Therefore a revised wording has to be discussed with the applicant too.

5.2 Solder tin of the thermo fuse with a defined low melting point – Friwo (set 2 request no. 18)

5.2.1 Description of requested exemption

The applicant requires an exemption for lead and cadmium in low melting solders, which he uses in thermofuses of linear power transformers. The permormance of these power transformers range between 3 and 20 W.

The global annual amounts of lead used in this application are 20 kg per year, and 200 g of cadmium.

The low melting solders in the thermofuses guarantee the safety of the linear power transformers. In order to fulfil this functionality reliably, the solder alloys must have sharply defined low melting points.

The applicant proposes the following wording for the exemption:

Lead and cadmium in solders with melting points of 96, 124 and 145 °C for application in thermo fuses of linear power transformers.

5.2.2 Summary of justification for exemption

Applicant's criteria for justification

No lead-free and cadmium-free alternatives are available for the low melting solders

96°C- fuse (Bi 46, Sn 34, **Pb 20**)

124°C- fuse (Bi 55,5, **Pb 44,5**)

145°C- fuse (Sn 50, **Pb 32**, **Cd 18**)

These solders are used in thermo fuses of linear power transformers in the performance range of 3 – 20 W. The melting points of any alternative alloys must be close to the above melting points to make sure to stick to the requirements according to the standard EN 60950. The applicant can not assure that the electrical power supplies will not fail safety, if he doesn't use the thermo fuses with a defined melting point (96°C, 124°C, 145°C).

The applicant provided a list showing all relevant alloys for the special applicant's melting point range (Statement Stannol.pdf).

Table 3: Low melting point alloys

Alloy	Solidus Melting Point	RoHS substance	Eutectic
Bi50Pb26,7Sn13,3Cd10	70	Lead/Cadmium	
In66,3Bi33,7	72	Lead-free	
Bi57In26Sn17	79	Lead-free	
In44Sn42Cd14	93	Cadmium	
Bi46Sn34Pb20	96	Lead	
Pb42Sn34Bi24	99,5	Lead/	non eutectic
In52,2Sn46Zn1.8	108	Lead-free	
In52Sn48	118	Lead-free	
Bi55,5Pb44,5	124	Lead	
Bi58Sn42	138	Lead-free	
In97Ag3	143	Lead-free	
Pb43Sn43Bi14	144	Lead	non eutectic
Sn50Pb32Cd18	145	Cadmium	

These alternative, RoHS conform alloys cannot suffice the requirements. To guarantee the required safety, the melting point must be sharply defined and reproducible in which the alloys melt. Non-eutectic alloys are not appropriate as metallurgic changes during ageing can form low melting phases in the grain boundaries resulting in undue failure of the power transformer. The melting point range of RoHS conform alternatives is too wide and not reproducible enough in order to suffice the safety requirements for the linear power transformers. In case of Indium containing alloys there are not sufficient data available, which are relevant for the application, according to the applicant. For example tin/indium alloys are extremely soft; therefore creep resistance and fatigue behaviour are poor. Low melting alloy 108°C, 117°C, and 143°C are currently no solutions.

According to the applicant, an alternative design of the linear power transformers in the performance range of 3 – 20 W is not possible in order to achieve RoHS conformity.

The applicant says that switched mode power transformers are a RoHS compliant alternative technology for the AC-DC linear power transformers and will successively replace the linear ones in the next ten years. According to the applicant no alternative technology is available for AC-AC linear power transformers.

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

6 Further proceeding

The focus for the forthcoming work will lie on the closure of final recommendations of requests from set 2 until the next monthly report.

As described above the focus of the further evaluation work for set 3 will lie on the extensive and thorough analysis of the LTB issue in order to give consistent recommendations. This will be followed by similar questions sent out to the concerned applicants. For all other requests of set 3 other overlapping issues need to analysed before being able to sent out targeted questions to applicants and other stakeholders.