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Content

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. A first set of answers had been received until the last monthly report and made final recommendations possible for some requests. Since then most other requests from set 2 could be evaluated.

Table 1: Overview status quo requests set 2

No.	Title	Applicant	Status Quo
2	Mercury in switches	Pickering	Final recommendation possible (see section 5.1)
3	Special ICs having tin-lead solder plating on leads used in professional equipment	Thomson	Close to final recommendation (see section 5.2)
4	Specific modular units including tin-lead solder being used in special professional equipment	Thomson	Close to final recommendation (see section 5.3)
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 Annex 1)
6	Lead in solder for printed circuit boards for emergency lighting products	LIF	Request has been withdrawn by applicant (see fifth monthly report)
7	Hexavalent chromium (Cr-VI) in chromate conversion coatings as surface treatment	Circuit Foil	Close to final recommendation – minor clarifications still necessary (see section 5.4)
8	Lead in gas sensors	Dräger	Final recommendation possible (see section 5.5)

No.	Title	Applicant	Status Quo
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 Annex 1)
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 Annex 1)
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 Annex 1)
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)
16	Lead alloys as electrical/mechanical solder for transducers used in high-powered professional and commercial loudspeakers	Meyer Sound	Close to final recommendation – minor clarifications still necessary (see section 5.6)
17	Cadmium oxide	INMET	Final recommendation given in fifth monthly report

No.	Title	Applicant	Status Quo
18	Solder tin of the thermo fuse with a defined low melting point	Friwo	Close to final recommendation (see section 5.7)
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 (see section 5.8)

In December the fourth consultation round was launched by the Commission. Table 2 below gives an overview over the corresponding set 3 of requests for exemption.

Table 2: Overview requests set 3

No.	Title	Applicant
1	On-Semi MCR265-10 SCR	Helval Merca Ltd
2	Components NEC V55	CPG International
3	The use of lead in solder applications for electronic components of musical instruments having an average lifespan in excess of 10 years	Bristows
4	Lead solder alloy in Surge protective devices (SPDs)	ZVEI
5	Inventory of Special ICs having tin-lead solder on/in leads/balls, used in specialist/professional equipment	Calibre
6	Lead alloys as electrical/mechanical solder for transducers used in high-powered professional and commercial loudspeakers	Hosiden Besson Ltd

No.	Title	Applicant
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
8	T in-lead solder in the manufacture of professional audio equipment	Lectrosonics Inc.
9	Specific modular units including tin-lead solder being used in special professional equipment	Avolites Ltd
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
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
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
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

Evaluation of requests from set 3 will start as soon as the consultation has closed on 10 February 2006. Preparatory work has already started (e.g. identification of overlapping issues between single exemption requests; allocation of stakeholder comments to specific requests).

4 Results

It was possible to give final recommendations for some remaining open request from set 2. 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.

Eight requests have been withdrawn by the applicants. The corresponding e-mails can be found in the fifth monthly report and in Annex 1 to this report.

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. For requests close to final recommendation a first evaluation is given which will though still be subject to changes.

5 Requests set 2 open for recommendation

The following section contains final recommendations for some of the requests of set 2. Furthermore it contains the description of requests which are close to final recommendation and for which minor clarifications are still necessary.

5.1 Mercury in switches – Pickering (set 2 request no. 2)

5.1.1 Description of requested exemption

Pickering Electronics has requested an exemption for the use of mercury in switches within mercury-wetted reed relays. Mercury is used to make the switch connection and thus complete the circuit. The switch is assembled into a plastic encapsulated package called a relay. Relays are used in test and measurement and control/instrumentation equipment in a variety of applications.

Mercury is used for two reasons: “low bounce” and “low contact”. A switch bounces when a switch closes to complete a circuit and the switch blades can make contact intermittently for short periods of time. Non mercury switches have a higher tendency to bounce. The use of mercury overcomes this problem. This means when the switch closes, its resistance is lower (i.e. “contact resistance”). If the contact resistance is too high, equipment may not interpret the switch as being closed even though it is. This will cause erroneous functionality.

The mercury content is estimated to be < 5 weight% of a switch (corresponding to 10 mg of mercury) and < 0,14 weight% of a typical relay corresponding to a total annual quantity of 215 g p.a. in 2004.

5.1.2 Summary of justification for exemption

The applicant justifies his exemption request according to technical criteria:

- He claims that no substitution exists currently but fails to give more details on this. He only states that switches are supplied and that there are no known plans to develop substitutes.

- According to the applicant if the switch is substituted by a switch that does not contain mercury it will no longer provide the correct performance and thus will not be suited for its intended application.

A critical review of the documents made available by the applicant and of further data and information given by other parties lead to the following observations and conclusions:

- The arguments put forward by the applicant are not valid: no kind of evidence is given for justification of the exemption request. Upon demand of the consultants, the applicant has neither provided further information.
- The applicant has not been able to name specific applications in which mercury switches are used that do fall under the scope of RoHS. It is only stated that the relays containing the switches are used in test equipment which are used in medical, IT, instrumentation/control and telecoms applications. The request has not been specified for a specific application.
- Furthermore, stakeholders have provided additional information on substitution possibilities for mercury-wetted reed relays. According to a coalition of Environmental and Health NGOs “mercury relays (and switches) are a large group of products which have gradually been replaced by electrical and electronic alternatives.” In Sweden, where a general ban on mercury was implemented, mercury-containing relays are routinely being replaced by alternative technology.
- According to the documentation provided by stakeholders in the context of the stakeholder consultation, alternative components for mercury-wetted reed relays are solid-state switches, electro-optical switches and semi-conductors.

5.1.3 Final recommendation

In view of the above mentioned points, it is recommended not to grant an exemption for the requested application of mercury in switches since neither specific applications are named by the applicant nor is there sufficient evidence given for justification of the exemption request. Furthermore sound evidence is given on existing and available substitutes. The applicant was given the chance to take position concerning the possibilities of use of these substitutes for his applications but did not take it.

5.2 Special ICs having tin-lead solder plating on leads used in professional equipment – Thomson (set 2 request no. 3)

5.2.1 Description of requested exemption

Substance

Lead

Function

Constituent in finishes on component leads

Specific application

Finishes on leads of customized or single source integrated circuits (ICs) for use in professional TV broadcasting equipment.

Precise wording as proposed by the applicant

"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."

5.2.2 Summary of justification for exemption

Applicant's criteria for justification

Amount of lead involved around 1.4 kg worldwide and around 600 g in Europe.

Long product commercial life time

- Product development times can vary from 6 months to 3+ years, with an average of around 2 years.
- Once the physical product is in production, it is very common to continue development of new features by means of software enhancements for 5-10+ years. Example: Customers install a large Routing System with the expectation of being able to keep it in service for at least 10 and often up to 20 years. They also expect to be able to upgrade the system by means of new hardware or software for a large portion of the service life of the product.
- The re-design circles of these products ca be up to 5 years

Specific conditions of the supply chain

- Products sold in very low volume only, and few of such special ICs will be used: one or two in some of the boards.
- ICs are customer specific and produced in small quantities, often in one production run. Some of the ICs are no longer available after some years, making it impossible to shift them to lead-free versions.
- Users are forced to buy big stocks at once for the supply of the coming years, and sometimes make a last-time-buy to sustain future production over the commercial product life time.
- Over the year 2004, the applicant made a last order for the current generation of products that will provide continued supply of these components for the remaining commercial life of these products that should end by the end of 2007.
- Suppliers continue advising the applicant to make last order on additional components for which there is no technically viable replacement. The applicant intends to place the last order by end of March 2006.
- Redesign of non-compliant IC's suitable for use in a next generation product typically requires 24-36 months. Integration in a product typically requires 6-12 months after the availability of samples of the new IC.
- In 2003, the applicant started developing and initiate component classification for RoHS compliance. Many component and module manufacturers were not aware of the RoHS directive and very few components were classified. Even in 2005, still encountering manufacturers whose components are not compliant.
- In some cases lead-free components are not currently available and until they are, prototyping or manufacturing is not possible. There are also components as referenced in this exemption request that will never be RoHS compliant so that this exemption is required.
- Fully ROHS compliant designs are in process for the next generation of equipment due to be released within the next 2-4 years
- The applicant says that a major problem on the way to RoHS compliance has been that there was a lack of clarity in the directive. Until last year many component vendors (our suppliers) could not tell whether or not their parts were compliant or not, let alone announce plans for RoHS compliant replacement parts, or be able to provide sample parts to prove the transparency of these new parts when run through new lead free assembly processes. In other cases, manufacturers outside Europe were either not aware of ROHS, or misunderstood the requirements as it applied to their components. Once the requirements were clarified, the flow of information in the supply chain sped up significantly, but even today there are shortages of RoHS compliant parts to build

fully compliant designs. For many of our suppliers the process has been extremely difficult, mainly due to the significant changes and verification required for each component:

Legislative RoHS schedule versus long product life times

- There is a discrepancy between the way the RoHS legislation has been set and the long cycles of the specific professional products industries. By contrast, it's comparatively easy for consumer products using standard components in high volumes and having a commercial cycle of 6 to 12 months to manage their transition according to the timing imposed by RoHS, however it is quite unrealistic for special professional products.
- The discussions on important details of the RoHS directive implementation made the situation difficult for a long-term business like the TV broadcasting equipment business.

Economic impacts

- The existing resources for developing new products are inevitably limited and it's impossible to redesign all these products in a couple of years. This is even more critical considering the number of SMEs active in this field in EU.
- Re-design and re-engineering of the equipment just for RoHS compliance of these ICs is too expensive.

Environmental impacts

- Discarding such ICs will generate unnecessary waste as it will just happen sooner rather than later. It would generate more waste since a number of other components or assemblies involved in the same product will be also need to be discarded.
- These types of very specific professional equipment are commonly offered for sale on the used equipment market after their first service life (often several times).
- Finally, at the product's end-of-life it will be taken-back under the WEEE directive. At that time it will be carefully disassembled, ICs and valuable components are recovered, tested and reused or recycled. So, in the end, no RoHS controlled substances are expected to enter the environment as waste.
- Another environmental aspect of the case is the fact the alternate solutions for soldering are not exempt of environmental problems. Comparative Life Cycle Analysis are showing the environmental benefit of the standard alternate solutions (like Sn-Ag-Cu) is not always obvious. This further reduces the relative impact of the expected exemption. The recovery approach as described above is in fact a much more effective measure.

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

The applicant, manufacturer of professional broadcasting equipment, requests this exemption for

- the repair of equipment put on the market before the RoHS deadline July 2006 AND equipment put on the market after the deadline July 2006, if the exemption is granted. The use of non-RoHS-compliant components for the repair of equipment put on the market before July 1, 2006, is already exempted. However, this is not the case for equipment put on the market after the deadline.
- upgrading customers' equipment with new modules and functions as long as they want to use this equipment. This requires software and also hardware upgrades. If these upgrades are impossible, the equipment will have to be scrapped, or customers and in consequence the manufacturers will have severe disadvantages. The applicant says that
  - the low volume of specific components makes a RoHS-compliant component redesign impracticable for existing products.
  - the long-term product re-design cycles of up to 3 years, the long commercial life time of 5 to 10 years and more make re-design not viable in order to be in line with the RoHS deadline.

  According to the Commissions FAQ document (http://europa.eu.int/comm/environment/waste/pdf/faq_weee.pdf), the upgrade of equipment put on the market before July 1, 2006 is possible with components that are not RoHS compliant: "The use of non-RoHS compliant material in electrical and electronic equipment (EEE) products put on the market before 1 July 2006 for the purposes of capacity expansion and/or upgrade is allowed in principle provided that the EEE is not put on the market as a new product. If after the capacity expansion and/or upgrade the EEE is put on the market as a new product it should comply with the RoHS directive. However, if after capacity expansion and/or upgrade the EEE is put on the market as a reused product, the ROHS Directive does not apply." The requested exemption is therefore not required to upgrade products put on the market before July 1, 2006.
- New products with non-RoHS compliant components put on the market after the deadline July 2006. The aplicant claims he has to make long-time orders and now wants to use up all these components in production until the next generation re-designed equipment is available for the market. Additionally, products are designed for long commercial life times of 5 to 10 years and more. Being RoHS-compliant would thus interrupt the commercial life of products designed for these long commercial lifes. In this sense, compliance is not a problem for consumer electronics with short re-design cycles according to the applicant.

However, it must be clearly stated that this part of the exemption request is not in line with article 5 (1) (b) of the RoHS Directive. Technically, the ICs in the focus can be produced RoHS compliantly. Additionally, the applicant knows the long-term character of his business and therefore can be expected to react more prospectively to technical or legal developments interfering with his business. The manufacturers claim that details of the RoHS Directive, in particular the definition of the threshold value for the banned substances, has only be inserted into the legislation in August and October 2005 (2005/618/EC, 2005/717/EC and 2005/747/EC). He claims that before he did not have enough legal security in order to start the re-design of the customer specific or single source ICs.

The applicant says that he could not start the redesign in time due to the limited availability of RoHS compliant components, the lack of clear transition deadlines of components to RoHS conform versions, and the lacking awareness of component manufacturers outside the EU. However, these are generally observed problems in the transition process and each producer of EEE has to handle it. This may be a more complex task considering the longer design cycles and the discontinous production of these components, but it is not an impossible task to cope with.

Environmental Aspects

The applicant stresses the fact that the components are available and should be used. If the exemption is not granted, they become waste prematurely causing environmental burdens. This burden, however, can be reduced as the components can be used for upgrades and repair. Furthermore, the environmental burden does not result from the nature of the substitutes, but from logistical imbalances. Here as well, any other manufacturer may experience similar problems, although they may be more severe due to the low volumes of components involved and the single order policy of the component manufacturers.

The applicant says that this equipment will be taken back at end-of-life and will be disassembled, re-used and recycled. If this happens, it certainly reduces the environmental impact of lead. It must be stated, however, that a reduced environmental impact of the RoHS-banned substances does not justify an exemption under the criteria of article 5 (1) (b) of the RoHS directive as long as the substitutes themselves do not cause higher environmental impacts. The fact that some studies doubt the environmental profit of the materials substituting the substances banned in the RoHS directive does not change this situation.

5.2.4 Final recommendation

No final recommendation can be given at this stage. The last point that needs to be clarified is the fact whether a substitution is technically not feasible. Should the applicant be able to provide a certificate of his suppliers that they cannot (due to technical and/or logistical reasons) supply him with RoHS compliant components, a sufficient justification according to Article 5 (1) (b) may be given. Here there is still need of clarification with the applicant.

The exemption is not necessary to repair and upgrade existing equipment as intended by the applicant. The RoHS Directive in this case does allow the use of components that are not RoHS conform.

5.3 Specific modular units including tin-lead solder being used in special professional equipment – Thomson (set 2 request no. 4)

5.3.1 Description of requested exemption

Substance

Lead

Function

Lead in tin-lead solder (~40%)

Specific application

Solder in customized assemblies including power supplies, small displays and specialized connectors. The displays are small (less than 50 cm2) and either custom LCD or EL based. Use in specific professional equipment for broadcasting.

Precise wording as proposed by the applicant

"Lead in tin-lead solder in custom designed modular units: power supplies, display modules less than 100 cm², 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."

5.3.2 Summary of justification for exemption

Criteria for justification

The amount of lead involved is around 2.5 kg worldwide and less than 1 kg in Europe.

The majority of assemblies in products manufactured are lead-free, but a few modular components are not available lead-free. The manufacturer may use tin-lead for soldering components within these modular components. These modules must be purchased as a lifetime buy since there are no alternate manufacturers due to technology changes and low production volume.

The assemblies that include these modules will be otherwise totally lead-free (solder, finish, any). The modules will be added by hand using lead-free solder or other means of compliant connections. The modules themselves may include a small amount of Sn-Pb solder, typically 0.1 gram and no more than one gram. The display modules are typically custom designed LED segmented character displays or similar LCD units.

The same long product and design cycles apply to these modules as pointed out in exemption request no. 3 of this third stakeholder consultation round. Also the environmental reasons given are identical to exemption request no. 3.

Specific conditions of the supply chain

- Sub-contractors, manufacturers of those custom modular components, are not all planning to convert to lead-free due to the low volume of business. Many of these devices are near the end of their business life.
- The only solution for the equipment integrator will be to redesign the system to replace the affected modular functions.
- To restart the development at sub-contractors requires new tooling and set up of new production processes but is not viable doe to the low volume of the production.
- The modules are customer specific and produced in small quantities, often in one production run.
- Some of modules are no longer available after some years, making it impossible to shift them to lead-free versions.
- This forces users to buy big stocks at once for the supply of the coming years, and sometimes make a last-time-buy to sustain future production over the commercial product life time.

Economic impacts

- The existing resources for developing new products are inevitably limited and it's impossible to redesign all these products in a couple of years. This is even more critical considering the number of SMEs active in this field in EU.
- Re-design and re-engineering of the equipment just for RoHS compliance of these ICs is too expensive.

Environmental impacts

- Discarding such ICs will generate unnecessary waste as it will just happen sooner rather than later. It would generate more waste since a number of other components or assemblies involved in the same product will be also need to be discarded.
- These types of very specific professional equipment are commonly offered for sale on the used equipment market after their first service life (often several times).
- Finally, at the product's end-of-life it will be taken-back under the WEEE directive. At that time it will be carefully disassembled, ICs and valuable components are recovered, tested and reused or recycled. So, in the end, no RoHS controlled substances are expected to enter the environment as waste.
- Another environmental aspect of the case is the fact the alternate solutions for soldering are not exempt of environmental problems. Comparative Life Cycle Analysis are showing the environmental benefit of the standard alternate solutions (like Sn-Ag-Cu) is not always obvious. This further reduces the relative impact of the expected exemption. The recovery approach as described above is in fact a much more effective measure.

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

The applicant, manufacturer of professional broadcasting equipment, requests this exemption for

- the replacement/repair of modules in equipment put on the market before the RoHS deadline July 2006 AND equipment put on the market after the deadline July 2006, if the exemption is granted. The use of non-RoHS-compliant modules for the repair/replacement of modules in equipment put on the market before July 1, 2006, is already exempted. However, this is not the case for equipment put on the market after the deadline.
- upgrading customers' equipment with new modules and functions as long as they want to use this equipment. This requires software and also hardware upgrades. If these upgrades are impossible, the equipment will have to be scrapped, or customers and in consequence the manufacturers will have severe disadvantages. The applicant says that
  - the low volume of specific modules makes a RoHS-compliant component redesign impracticable for existing products.
  - the long-term product re-design cycles of up to 3 years, the long commercial life time of 5 to 10 years and more make a re-design of these modules not viable for the current modules in order to be in line with the RoHS deadline.

  According to the Commissions FAQ document (http://europa.eu.int/comm/environment/waste/pdf/faq_weee.pdf), the upgrade of

equipment put on the market before July 1, 2006 is possible with components and modules that are not RoHS compliant: “The use of non-RoHS compliant material in electrical and electronic equipment (EEE) products put on the market before 1 July 2006 for the purposes of capacity expansion and/or upgrade is allowed in principle provided that the EEE is not put on the market as a new product. If after the capacity expansion and/or upgrade the EEE is put on the market as a new product it should comply with the RoHS directive. However, if after capacity expansion and/or upgrade the EEE is put on the market as a reused product, the ROHS Directive does not apply.” The requested exemption is therefore not required to upgrade products put on the market before July 1, 2006.

- Non-RoHS-compliant modules in new products put on the market after the deadline July 2006. The applicant claims he has to make long-time orders and now wants to use up all these modules in production until the next generation re-designed equipment is available for the market. Additionally, products are designed for long commercial life times of 5 to 10 years and more. Being RoHS-compliant would thus interrupt the commercial life of products designed for these long commercial lifes. In this sense, compliance is not a problem for consumer electronics with short re-design cycles according to the applicant.
  However, it must be clearly stated that this part of the exemption request is not in line with article 5 (1) (b) of the RoHS directive. Technically, the modules in the focus can be produced RoHS compliantly after the applicant has re-designed the modules for a new product generation. This may be a more complex task in this business environment, but not an impossible one. The applicant claims that details of the RoHS directive, in particular the definition of the threshold value for the banned substances, has only be inserted into the legislation in August and Oct. 2005 (2005/618/EC, 2005/717/EC and 2005/747/EC). He claims that before he did not have enough legal security in order to start the re-design of the customer specific or single source ICs. It must be clearly stated that not even the consumer electronics industry, which the applicant stresses as an easy-to-comply branch, would have been able to comply if they had started the redesign of their products in August 2005.

  The applicant says that he could not start the redesign in time due to the limited availability of RoHS compliant components, the lack of clear transition deadlines of components to RoHS conform versions, and the lacking awareness of component manufacturers outside the EU. However, these are generally observed problems in the transition process and each producer of EEE has to handle it. This may be a more complex task considering the longer design cycles and the discontinuous production of these components, but again it is not an impossible task to cope with.

Environmental Aspects

The applicant stresses the fact that the modules are available and should be used. If the exemption is not granted, they become waste prematurely causing environmental burdens. This burden, however, can be reduced as the modules can be used for upgrades and repair, and for exports of professional broadcasting equipment outside the EU. Furtheron, the environmental burden does not result from the nature of the substitutes, but from logistical imbalances. Here as well, any other manufacturer may experience similar problems, although their avoidance may be more challenging task due to the low volumes of components involved and the single order policy of the module manufacturers.

The applicant says that this equipment will be taken back at end-of-life and will be disassembled, re-used and recycled. If this happens, it certainly reduces the environmental impact of lead. It must be stated, however, that a reduced environmental impact of the RoHS-banned substances does not justify an exemption under the criteria of article 5 (1) (b) of the RoHS directive as long as the substutites themselves do not cause higher environmental impacts. The fact that some studies doubt the environmental profit of the materials substituting the substances banned in the RoHS directive does not change this situation.

5.3.3 Final recommendation

No final recommendation can be given at this stage. The last point that needs to be clarified is the fact whether a substitution is technically not feasible. Should the applicant be able to provide a certificate of his suppliers that they cannot (due to technical and/or logistical reasons) supply him with RoHS compliant components, a sufficient justification according to Article 5 (1) (b) may be given. Here there is still need of clarification with the applicant.

The exemption is not necessary to repair and upgrade existing equipment as intended by the applicant. The RoHS directive in this case does allow the use of components that are not RoHS conform.

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

5.4.1 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.

5.4.2 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.

Within the stakeholder consultation a couple of contributions were received relating to the request from Circuit Foil from several manufacturers as well as from industry associations:

- SBAC (Society of British Aerospace Companies)
- Groupe SEB, France
- IMR Test Labs, USA
- Taylor Company, USA
- California Steel Industries, USA

- Whirlpool Corporation, USA
- Bissell Homecare, USA
- Ryerson Tull, USA
- National Coil Coating Association, USA
- Material Science Corporation, USA
- Harris Steel Company, USA
- BAE Systems
- TT electronics, USA

All of these contributions do not relate to copper foils but to corrosion protection of other metals. The data and information given by these stakeholders is therefore not applicable concerning to the request of Circuit Foil.

5.4.3 Final recommendation

Although the applicant provides most of data and information needed to evaluate the request there are some remaining questions concerning the availability of substitutes. These still open questions are to be clarified including information by third parties.

Notwithstanding, the wording of this request has to be restricted to copper foil used for CCL in PCB. In order to avoid misinterpretation the revised wording should be done in reconciliation with the applicant.

5.5 Lead in gas sensors – Dräger (set 2 request no. 8)

5.5.1 Description of requested exemption

Dräger Safety has requested an exemption for lead in gas sensors. Gas sensors are used for measuring gas concentrations, e.g.

- Oxygen in medical equipment and in life support systems
- Oxygen and toxic gases in monitoring instruments for occupational health
- Oxygen and toxic gases in breathing protection systems

Gas sensors are electrochemical sensors in which one of the electrodes is made of lead. Gas sensors have to be exchanges periodically (approx. once a year) to keep applications running.

The wording provided by the applicant is “Lead in gas sensors”.

5.5.2 Summary of justification for exemption

The applicant justifies his exemption request according to the following technical and environmental arguments:

- For equipment already in use or in production there are no substitutes available with the same functionality (technical argument)
- The functionality of some of the gas sensors – especially for measuring oxygen concentrations – rely on the use of lead (the lead reacts with the gas to be measured, is electrochemically oxidised and the electrical current produced by this reaction is a measure for the actual gas concentration) (technical argument).
- Already installed life saving instruments using gas sensors would not be useable anymore since gas sensors need to be exchanged periodically (environmental argument)

A critical review of the documents made available by the applicant and of further data and information given by other parties lead to the following observations and conclusions:

- The arguments put forward by the applicant are not valid. The applicant has explained that he considers gas sensors not to fall under the scope of the RoHS Directive since the applications mentioned are mainly used in products falling under categories 8 and 9 of the WEEE Directive.
- The applicant wishes to have an exemption granted for 2012 in order to be prepared for a possible revision of the RoHS Directive with the goal to include categories 8 and 9 into its scope. This is clearly not in line with Article 5 (1) (b) since exemptions can only be granted for applications falling under the current scope of the RoHS Directive.

5.5.3 Final recommendation

In view of the above mentioned points it is recommended not to grant an exemption for the requested application of lead in gas sensors since according to the applicant the requested application currently does not fall under the scope of the RoHS Directive.

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

5.6.1 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"

5.6.2 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: "...leadfree 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 directly or indirectly to report their status of leadfree 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. Reply from Bose is still pending.

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.

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) is currently underway – the first reply was, that they cannot state, whether their announcement holds true also for the transducers, as they get them supplied from their US sites and do not have any related RoHS information at hand currently.

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. Reply is pending.

5.6.3 Final recommendation

No final recommensation possible yet, as there is no clear trend yet, whether technical feasibility is given or not as it has to be clarified, if the Yamaha case is transferable to Meyer Sound products; depending on the input expected from Yamaha, AVI / Telex, Bose, Elektrisola this issue has to be clarified further with the applicant

Regarding the precise wording for an exemption – in case it is finally recommended and granted - 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 and above) loudspeakers”.

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

5.7.1 Description of requested exemption

Substance

Lead and cadmium

Amounts:

- Lead: 20 kg of lead per year globally
- Cadmium: 200 g of Cd per year globally

Function

Melting of the alloys at sharply defined low melting points

Specific application

Tin solder in thermo fuses with defined low melting points for linear power transformers

Precise wording

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

5.7.2 Summary of justification for exemption

Applicant's criteria for justification

No lead-free and cadmium-free alternatives 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**)

used in thermofuses of linear power transformers. 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.

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 reproduceable 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 reproduceable 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 his linear power transformers is not possible in order to achieve RoHS conformity.

The applicant says that an alternative technology to the linear power transformers will successively replace the linear ones in the coming years. However, due to the technical advantages, galvanic isolation, high surge and burst resictance, robustness and high lifetime, many customers request the linear technology. The alternative technology will not completely avoid the necessity to use thermo fuses.

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

It is clearly understood and documented that alternative RoHS compliant alloys for thermo fuses need to have a narrow and reproduceable melting point range.

The supporting document from Stannol mentions several alternatives that are in line with the requirements of the RoHS directive. The document claims that there are no data available on

indium containing subsitutes which are relevant for the application. This is not acceptable, even if there are some hints that these alloys might not be appropriate, as the RoHS directive has been known for years already and the respective assessments should have been conducted. The applicant so far could not justify this issue.

It is not clear how the applicant's competitors solve the problem and why this solution is not appropriate for the applicant's product. Further on, the applicant mentions an alternative technology that will replace the linear power transformers in the coming years. At the same time he maintains that some customers still want to use the linear power transformers due to the technical advantages, galvanic isolation, high surge and burst resistance, robustness and high lifetime. It is not yet clear whether the alternative technology is RoHS conform and whether it can fully replace the linear transformers.

5.7.3 Final recommendation

There are open questions, which the applicant could not answer in time for this report:

1. The standard EN 60950 is a general standard, not a FRIWO internal standard? And this standard necessarily applies to your products requiring the thermo fuses?
2. You sent me the document "Measurement data Thermo fuse A.pdf", which should prove that alternative, RoHS conform alloys are not appropriate for your application. The document is not detailed enough. Please explain the experiments and the results in detail, and let me know, which alternative alloys you tested.
3. How do your competitors in the market solve the problem for which you request an exemption? Why is their way not appropriate for you?
4. You said in your answers that the use of alternative technology will successively substitute the linear transformers. The alternative technology are the switched power transformers?
5. Is this alternative technology RoHS conform?
6. You say that the alternative technology will successively substitute the existing linear power transformers. Why is it still necessary to produce this non-RoHS conform power transformers until then? Are there plausible TECHNOLOGICAL or other reasons why customers still need linear power transformers?

A final recommendation for this exemption request will certainly be possible for the next report.

5.8 Lead based solders sealed or captured within heat-shrinkable components and devices – SEIP (set 2 request no. 23)

5.8.1 Description of requested exemption

SEIP (Sumitomo Electric Interconnect Products) has requested an exemption for the use of lead in solders within heat-shrinkable devices. Heat-shrinkable devices consist of a cable encapsulated by a plastic shell that is soldered in a first process step (lower temperature) and then processed with the goal to melt the plastic encapsulation (higher temperature) in order to protect the cable from external impacts. This application is mainly used in military applications but also in IT and communications equipment. Lead is needed in the solder due to its low melting point characteristic in order to be able to keep a lower process temperature for soldering.

The wording provided by the applicant is:

"*Lead based solders sealed or captured within heat-shrinkable components and devices*"

5.8.2 Summary of justification for exemption

According to the applicant the following criteria have been put forward as justification for the exemption request:

- Use in heat-shrinkable devices needs solders with a melting point in the range of eutectic SnPb. As they are used as preforms in the process, brittle materials, such as Bismuth and Antimony containing solders are not suitable (according to the applicant manufacture of preforms is not possible with these brittle alloys). Consequently, the applicant claims that there is no applicable solder alloy for this use.

The critical review of documents and further information has lead to the following observations and conclusions:

Sumitomo states, that "the vast majority of devices are used for military applications ... or in the aerospace industry" (exempted anyhow). Requested to state the RoHS relevant applications Sumitomo named IT and telecommunications equipment. Sumitomo estimates a figure of 6.75 kg lead consumption by Sumitomo for these applications, but on a global scale as they can't give data on end use in the EU (as they supply their components to assemblers of end-products not to the end-user market directly).

Sumitomo has been asked to provide a confirmation from their solder manufacturer, that from their point of view there is also no alternative. The solder manufacturer Cookson Electronics denies the availability of an appropriate alternative for this specific application based on the following reasons:

- As the melting range of the solder is a crucial issue, such alloys as Sn90.5Ag2Bi7.5, Sn92Ag3.5Bi5Cu0.7 and Sn91.8Ag3.4Bi4.8 are outside of the temperature range

- Furthermore it is confirmed, that all Bi containing alloys are to brittle to make collars of. The main reason is the fact, that Sn and Ag form a brittle intermetallic with Bi. Cookson Electronics is not aware of any Sb containing solder, that melts in the required range.
- Some Zn containing solders are in the required temperature range, but too corrosive for these applications.
- Sn77.2Ag2.8In20 has been stated as being “too cost prohibitive” for this application.

It was asked, if – besides cost reasons – there are any technical obstacles regarding the SnAgIn solder for this specific application. Clarification provided by Cookson Electronics:

- “One issue is that the thermal fatigue resistance is relatively low for In alloy. Soldering is also made more difficult due to In having a relatively 'stable' corrosion layer which is difficult to reduce by the type and volume of fluxes required for this application. Remember we are placing a solder sleeve inside a heat shrink tube. With this application we need to find a way to have a balance between insuring that we have enough flux to make a proper solder connection, however not have too much flux or have too active a flux so that it does not cause reliability issues down the road. The fluxes required to overcome this specific issue with In are not conducive to be used in this specific application.”

  Sumitomo stated that there are only two other competitors worldwide, manufacturing the same kind of devices: Raychem / Tyco Electronics and Phoenix Logistics. Phoenix Logistics clearly serves the military / aerospace sector, being not RoHS relevant. An inquiry at Raychem / Tyco Electronics lead to the following statement:

  - “Tyco has decided not to produce a range of RoHS compliant 150C-rated parts to replace non-compliant parts that contain Sn63Pb37 solder.
  - Tyco's approach has been to define two series of RoHS compliant alternatives:
    a. A series of 175C rated parts with Sn96Ag04 solder
    b. A series of 125C rated parts with Sn42Bi58 solder
  - Tyco performed extensive work to ensure the manufacturability of these parts and their suitability as high-reliability replacements for the Sn63Pb37 containing parts.
  - The 125C rated parts are also offered as alternatives to older RoHS non-compliant parts that contain lead and/or cadmium containing solders.
  - Tyco customers of former 150C-rated parts (SnPb) are advised to switch over to either 175C rated parts or 125C rated parts - in case they are affected by the RoHS.
  - Further details on the problem of solder sleeve manufacturing with Bi-containing alloys (see brittleness argument above) – if there is any such problem fort he Tyco application - are kept confidential.

The applicant has been informed about this status to give him a chance to comment on it.

5.8.3 Final recommendation

Based on the information given by Tyco Electronics RoHS compliant alternatives seem to be feasible. Thus, a recommendation to reject this request is likely, but a statement by the applicant is awaited to furnish the recommendation further.

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.

Evaluation of requests from set 3 will start as soon as the fourth consultation round has closed on 10 February 2006. Beforehand documents need to be checked on completeness and on overlapping issues with requests from previous sets.

Annex 1: Withdrawals of requests by applicants

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 (set 2 no. 5)

From:Meddour Amel <AMeddour@clamart.oilfield.slb.com>
To:RoHS Oeko-Institut <rohs@oeko.de>
Subject:Clarification needs exemption request RoHS No. 5
Date sent: Fri, 10 Feb 2006 10:54:11 +0100

Exemption request:

Solder 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 (No. 5)

Dear Ms Zangl,

Thank you for your email of 11 January 2006 regarding our request for an exemption from the requirements of the Directive on the restriction of hazardous substances in electrical and electronic equipment ("RoHS") and your request for further information.

Following further enquiries and review of our products to which our application for exemption relates we now consider the relevant products to be outside the scope of the RoHS Directive and therefore do not require the benefit of the exemption. Accordingly we request that our application for exemption is withdrawn.

Through further analysis of the relevant products, we are of the opinion that those products fall within one or more of the following exclusions from the scope of the RoHS Directive.

(1). Large Scale Stationary Industrial Tools ("LSSIT"). As noted in our original application to the EU Commission (by letter dated 11 February 2005) and as referred to in your email of 11 January 2006, relevant products are manufactured for use exclusively in oil and gas prospecting and exploration. With reference to the definition of LSSIT set out in the "FAQ" document published by the EU Commission in May 2005, we concur with your proposition in your email of 11 January that the relevant products fall within the definition of LSSIT when used in such applications. Accordingly, relevant products forming part of the combination of equipment and systems that comprise LSSIT are excluded from the scope of the RoHS Directive by virtue of Article 2(1) of the RoHS Directive.

(2). Monitoring and Control Equipment. In addition or as an alternative to (1) above, relevant products are exclusively monitoring and control equipment as listed in Annex IA, category 9 of the WEEE Directive (as applicable to the RoHS Directive). Accordingly, such

products are excluded from the scope of the RoHS Directive by virtue of Article 2(1) of the RoHS Directive.

(3) "Placed on the Market". In addition or as an alternative to (1) and (2) above, our products are manufactured in many cases for own use and in such circumstances will not be considered as "placed on the market" as defined in the guidance set out in the EU Commission Guide to the Implementation of Directives based on the New Approach and the Global Approach (the "Blue Book") to which the "FAQ document" also refers. In such circumstances we therefore consider relevant products to be outside the scope of the RoHS Directive by virtue of Article 4(1) of the RoHS Directive.

Taking into account the above factors we have concluded that the products to which we referred in our original application do not require the benefit of a product/application specific exemption from the requirements of the RoHS Directive. Therefore, we respectfully request that our application is withdrawn from the evaluation process with immediate effect and the EU Commission is advised accordingly. I would be grateful if confirmation of withdrawal of the application is confirmed to us in writing.

Kindly note that our opinions above are without prejudice to any further communications we may have with the EU Commission and/or any Member State competent authorities with regard to the application of the RoHS Directive.

We apologize for the oversight that led to our submission of this application and for any inconvenience caused.

I look forward to hearing from you.

Kind regards,

Amel Meddour.

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Schlumberger Riboud Product Center

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Non-consumer mechanical power transmission systems including speed reducers and mechanical couplings which rely on electrical/electronic components for safe control and operation – FALK (set 2 no. 11)

No written withdrawal was provided until now. An oral confirmation has been given to the consultants. Unfortunately even upon several requests the applicant has not yet provided the requested written information.

Cadmium-bearing copper alloys – Symbol (set 2 no. 13)

From:"MacLennan, Jacquelyn" <jmaclennan@whitecase.com>
To:env-rohs@cec.eu.int
Subject:SYMBOL - Request for Exemption for Copper Alloys containing up to 1.2% cadmium by weight in EEE (No 13)
Date sent: Tue, 24 Jan 2006 16:38:51 +0100

Mr. Klaus Koegler

Acting Head of Unit

DG Environment

G.4 - Sustainable Production and Consumption

European Commission

Dear Mr. Koegler

I would like to formally inform the Commission that Symbol Technologies Inc. has decided to withdraw its application for an exemption under the RoHS Directive for copper alloys containing up to 1.2% cadmium by weight in EEE. We have already informed Dr. Stéphanie Zangl of the Öko-Institut in Frieburg of this fact. Thank you for your assistance in the process of making this application.

Best Regards

Jacquelyn MacLennan

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Electrical/electronic components contained mobile and stationary air compressors and vacuum systems, compressed air contaminant removal systems and pneumatic contractor's air tools – Sullair (set 2 no. 14)

No written withdrawal was provided until now. An oral confirmation has been given to the consultants. Unfortunately even upon several requests the applicant has not yet provided the requested written information.