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

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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 has been received since then and has made final recommendations for possible some requests (see section).

Table 1: Overview status quo requests set 2

No.	Title	Applicant	Status Quo
2	Mercury in switches	Pickering	Questions to applicant sent out – no reply yet
3	Special ICs having tin-lead solder plating on leads used in professional equipment	Thomson	Close to final recommendation – minor clarifications still necessary (see section 5.1)
4	Specific modular units including tin-lead solder being used in special professional equipment	Thomson	Close to final recommendation – minor clarifications still necessary (see section 5.2)
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	Questions sent out to applicant (see Annex 1) – no reply yet
6	Lead in solder for printed circuit boards for emergency lighting products	LIF	Request has been withdrawn by applicant (see Annex 2)
7	Hexavalent chromium (Cr-VI) in chromate conversion coatings as surface treatment	Circuit Foil	Questions to applicant sent out – reply will be available only by end of January

No.	Title	Applicant	Status Quo
8	Lead in gas sensors	Dräger	Questions to applicant sent out (see Annex 1) –reply received shortly before editing report. Final recommendation due in next 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 possible (see section 5.3) - 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	Questions to applicant sent out – no reply yet
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 Annex 2)
13	Cadmium-bearing copper alloys	Symbol	Questions to applicant sent out (see Annex 1) – reply will be available only by mid January
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	Questions to applicant sent out – no reply yet

No.	Title	Applicant	Status Quo
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 Annex 2)
16	Lead alloys as electrical/mechanical solder for transducers used in high-powered professional and commercial loudspeakers	Meyer Sound	Questions sent out to applicant (see Annex 1) – no reply yet
17	Cadmium oxide	INMET	Final recommendation possible (see section 5.4)
18	Solder tin of the thermo fuse with a defined low melting point	Friwo	Final recommendation not possible – clarifications with applicant still necessary (see Annex 1)
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 possible (see section 5.5)
21	Use of the not lead free component NEC V25 in the Memor 2000	Datalogic	Final recommendation possible (see section 5.6) – 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 Annex 2)
23	Lead based solders sealed or captured within heat-shrinkable components and devices.	SEIP	Close to final recommendation – minor clarifications still necessary (see section 5.7)

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
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.”	UNICORE

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).

4 Results

It was possible to give a final recommendation for the remaining open request from set 1 no. 21 (see section 5.3).

Four requests have been withdrawn by the applicants. The corresponding e-mails can be found in Annex 2 to this report.

A number of requests from set 2 remain open since no answers have been provided yet. In cases were a date has been given until when answers will be provided, recommendations will be possible for the next monthly report. In cases were no answer/reaction has been received from the applicant, a final recommendation will be given on the basis of the information available.

Concerning overlapping issues between requests from set 2 and set 3 (e.g. set 3 no. 2 and set 2 no. 21) final recommendations need to be elaborated taking all relevant requests into account so as to avoid conflictive results.

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.

5 Requests set 1 and 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 Special ICs having tin-lead solder plating on leads used in professional equipment – Thomson (set 2 request no. 3)

5.1.1 Description of requested exemption

The applicant requests an exemption for lead used as constituent in finishes of application-specific custom designed integrated circuits (ICs) used in professional TV broadcasting equipment. Amount of lead involved is around 1.4 kg worldwide and around 600 g in Europe.

The wording as proposed by the applicant is:

"*Lead in tin-lead solder 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*."

5.1.2 Summary of justification for exemption

The applicant uses the following criteria as justification for the exemption request:

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.

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 are not aware of the RoHS Directive and very few components were classified. Even in 2005, one can still encounter 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.

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 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 that 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.

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

The applicant, manufacturer of professional broadcasting equipment, requests this exemption in order to

- be able to repair 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.
- upgrade customers' existing 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.
- be allowed to put non-RoHS compliant new products on the market after the deadline July 2006. The manufacturers claim they have to make long-time orders and now want 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 and short commercial lives of products, but create undue hardship for long-term oriented industries like the professional broadcasting equipment producers.

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). The applicant wants to

use all non-RoHS-compliant components that were UNDER DEVELOPMENT before this deadline.

From the consultant's point of view the following problems need to be taken into account

- this deadline, if accepted, would be difficult or impossible to be monitored and controlled.
- following this argument, all electronic component manufacturers could claim similar exemption for their products, as in this point they were in the same situation as the applicant's component manufacturers. They had to design new products ahead of the deadline the applicant mentions in order to be ready with RoHS compliant components in time. The crucial question in this context is when a company can be expected to react to the material bans in the RoHS directive: with the publication of the Directive in February 2003, or in October 2004, when the TAC published the guidance document on MCV's, or at another point in time? The same question arises in the context with the products affected by the RoHS Directive, which, without doubt, creates a lot of insecurity for industry. When could an industry like the one here be expected to react assuming that the RoHS Directive will affect its products?
  The applicant must be expected to react and start the re-design of his products to try to be ready for the deadline. It can also be expected that an industry with long product cycles also acts more anticipatorily.
- If the specific conditions of this industry justify an exemption to avoid undue hardships, what could thus be an appropriate deadline taking into account the specific situation of the applicant's industry, and how could it be monitored? Do all components carry marks or identification numbers that allow the unequivocal assessment of the time they were brought to market or produced? This could be used as a feature to control the compliance with a deadline.

The wording the applicant proposes does not sufficiently define whether the exemption shall apply to lead in tin-lead solders only or as well to the tin-lead finishes of the component leads.

The components and modules in question could be designed in a RoHS-compliant way. Technically, there is no need for this exemption, as long as logistical problems are not considered as technical ones with respect to the non-availability of certain components due to long component life cycles and low volumes.

5.1.3 Final recommendation

Regarding the above-mentioned questions a final recommendation is not yet possible.

The remaining open questions to the applicant are:

- Is it definitely clear that professional broadcasting equipment is within the scope of the RoHS Directive? If yes, since when has it been cleared?

- We are aware that tin-lead solders are used both for the solder itself and the finish on component terminations and leads. For both exemptions, no. 3 and 4, it is, however, not clear whether the exemption shall apply to lead in tin-lead solders used as solder (also on BGA's) only or as well to the tin-lead finishes on the component leads. Please specify.
- Do all components/modules involved carry marks or identification numbers that allow the unequivocal assessment of the time they were produced?
- Please provide a complete list of products that fall under the term "professional broadcasting equipment" and which the requested exemption should therefore cover.
- How long does it take to design a next generation broadcasting equipment? How long is the time from the beginning of the re-design to the production start of new products?
- Please explain in detail the problems that aroused or would have arisen if you had started redesigning your products in 2003, after the RoHS Directive was published and it was clear that it is thus enacted.

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

5.2.1 Description of requested exemption

The applicant has requested an exemption for lead in tin-lead solder (~40%) used on component leads, or lead as part of some components. The specific applications are custom assemblies including power supplies, small displays and specialized connectors. The displays are small (less than 50 cm2) and either custom LCD or EL based and used in specific professional equipment for broadcasting.

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

The wording provided by the applicant is:

"*Specific modular units including tin-lead solder being used in professional broadcasting equipment*".

The applicant has provided a revised wording:

"*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*."

5.2.2 Summary of justification for exemption

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

The majority of assemblies in products manufactured are lead-free but 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.

That is:

- Assemblies that include these modules will be otherwise totally lead-free (solder, finish, any)
- Modules will be added by hand using lead-free solder or other means of compliant connection
- Modules may include a small amount of Sn-Pb solder, typically 0.1 gram and no more than one gram.
    - Display modules are typically custom designed LED segmented characters displays or similar LCD units
- Long product and redesign cycles, identical to explanation in exemption request 3 of this third stakeholder consultation round
- Environmental criteria identical to exemption request 3 of this third stakeholder consultation round

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 assembler 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 due to the low volume of the production.
- The modules are customer specific and produced in small quantities, often in one production run.
- Some 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, an sometimes make a last-time-buy to sustain future production over the commercial product life time.

The environmental and economic impacts as well as the problems of the RoHS legislative schedule in opposition to the long product cycles are identical to exemption request 3 of this third stakeholder consultation round.

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

See exemption request no. 3.

5.2.3 Final recommendation

In analogy to exemption request no. 3 a final recommendation is not yet possible due to need of clarification with the applicant (see section 5.1).

5.3 Cadmium sulphide photocells – Perkin Elmer/Philips (set 1 request No. 21_a/b); cadmium in opto-electronic components – TESLA (set 2 request No. 10)

5.3.1 Description of requested exemption

All three requests (request No. 21_a/b set 1 and request No. 10 set 2) refer to the same general application: the use of cadmium compounds in photocells (i.e. photoresistors). The different applicants though name different specific kinds of application for which they require an exemption.

Perkin Elmer (request 21_a set 1) requests an exemption for

“Cadmium sulphide photocells for burner controls, automatic light switches, commercial light control systems and audio equipment, safety relevant controls in automotive appliances”.

Philips (request 21_b set 1) requests an exemption for

“Use of CdS photocells in daylight responsive dimming systems”.

TESLA (request 10 set 2) requests an exemption for

“Cadmium in opto-electronic components” naming “photocells for detection and measurement light level in visible spectrum, analogue optocuplers for application in signal control (especially in professional acoustics), optoelectronic wear-less potentiometers for avionics and power plant automation”.

The function of cadmium in the photocells is being a photosensitive material working in a photoelectric light sensor used as photoresistor in different applications. The particularity of photoresistors is to have a spectral response which matches the characteristics of the human eye ideally.

Perkin Elmer states that the amount of cadmium in each device amounts to 0,01 – 0,1 weight% respectively 0,043 mg and 1,023 mg of cadmium in the homogeneous material. In 2004 this applicant had distributed a total of 5,4 kg of cadmium through trade with photoresistors (e.g. compared to about 350 t of cadmium being traded annually in the EU for the use of cadmium in pigments).

5.3.2 Summary of justification for exemption

All applicants claim that it is in principle technically possible to substitute photoresistors with photodiodes or phototransistors but that these alternatives have strong disadvantages. These being:

- High component count (further electronics required) – according to Philips silicon sensors (i.e. photodiodes) can be used only in combination with a transimpedance amplifier (current to voltage converter) with trimmable gain. Furthermore an infrared rejection glass filter is required to bring the sensing range closer to the CIE photopic curve.
- Redesign of printed circuit board/changes in existing circuitry
- Inferiority in light detection performance (spectral sensitivity)
- Small amount of cadmium used

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

- Photoresistors and photodiodes cover different wavelengths of light. Another difference between the two components is their inertia which can be relevant for different types of applications.
- Not all applications mentioned by the applicant fall under the scope of the RoHS Directive. Indeed, some applications fall under category 9 of the WEEE Directive (i.e. monitoring and control devices such as burner controls and signal controls). Others are covered by another legislation (e.g. safety controls in automotive appliances).
- Hence only a few selected applications of CdS photocells are relevant under RoHS (e.g. auto-focus control in slide projectors, exposition and diaphragm control in cameras and possibly light control devices such as dimming systems). It is assumed that as long as the main purpose of an equipment is not to control or to monitor it should fall under the scope of the RoHS Directive (e.g. the main function of a light control device in a dimming equipment is not to control but to allow required lighting).
- Since CdS containing photocells can neither be considered as electrical contacts accounting for their electrical reliability nor can the CdS within a photocell be considered as a cadmium plating, there is no doubt that the application which is looked at here is not covered by the existing exemption under entry 8 Annex of the RoHS Directive.
- As a result of an LCA on CdS photoresistors and photodiodes made available by Philips it can be stated that „it does not make any difference from an environmental point of view“ whether it is photoresistors or photodiodes that are used. The environmental impact is in both cases dominated by the gold in bondwires. It is thus not the CdS layer which is responsible for the main environmental impact.

- According to a manufacturer of silicon-based photodiodes substitutes exist and are available in sufficient amount for 1 July 2006. Several companies have developed which are well suited to substitute CdS-based photoresistors[1]:
  - Photo-Integrated Circuits (ICs[2]) are able to integrate the current to voltage converter (usually realised with a transimpedance amplifier) and the infra-red rejection[3] into a single chip. Hence, there is neither a higher component count nor a more complex circuitry needed.
  - Additional functions can be integrated into silicon-based photodiodes (e.g. switch function).
  - The suitability of silicon-based photodiodes as substitute for CdS-based photoresistors has been confirmed by an independent external expert consulted on this issue.
- Further advantage of silicon-based photodiodes is their long-term stability compared to CdS-based photoresistors.

5.3.3 Final recommendation

Having regard to the above mentioned critical review and conclusions drawn thereof it is recommended not to exempt the use of CdS in photocells from the RoHS Directive since adequate substitutes exist and are available on the market in sufficient amount by 1 July 2006.

5.4 Cadmium oxide – INMET (set 2 request no. 17)

5.4.1 Description of requested exemption

The applicant has requested an exemption for cadmium as an alloy component in silver-based brazing alloys as well as in silver-based contact materials. The brazing alloys produced by INMET include 10 alloy grades containing from 13 to 27 weight% of cadmium. The contact materials produced by INMET include four grades of alloys and composites containing from 7 to 14 weight% of cadmium.

[1] A product description of these alternatives is described in Annex 3 of this report.

[2] An IC is a monolithic chip, i.e. a single piece of silicon on which an electronic circuit is printed.

[3] One manufacturer states that a special process block is incorporated into the Complementary Metal Oxide Semiconductor (CMOS) process flow. In this block a multi layer band pass optical filter is evaporated which restricts the silicon photodiode beneath the filter to respond only to wavelengths between 350 and 700 nm. These filters can be tailored to give an exact eye-like response. This effectively eliminates the strong infra-red response from silicon.

Cadmium is present in brazing alloys as an additive forming mainly solid solutions with silver, copper and zinc. Cadmium decreases the melting point of alloy steels and ensures better plasticity of joints. Cadmium-containing alloys are widely used to join many grades of alloy steels such as steel with sintered carbides, steel with different non-ferrous metals etc.

Cadmium is contained in contact materials forms single-phase solid solutions with silver. After internal oxidation, cadmium oxides arise due to oxygen diffusion to the Ag-Cd alloy. They are characterised by a high dispersion degree and are distributed uniformly over the whole cross-section of the product – wires, contact tips and rivets. Both grades of contact materials (AgCd and AgCdO) are the final products designed for sale. The function of cadmium (mainly in form of CdO) in these contact materials is to allow very good electrical properties during operation in electric switches (electric arc suppression, resistance to contacts tacking, low mass losses during switching, good electric conductivity, …). Moreover, materials containing cadmium or cadmium oxide are characterised by very high plasticity. The main area of application of this group of materials is electric contacts for relays, contactors and circuit-breakers.

No precise wording was provided by the applicant – even upon further request by the consultants. From the context of the request it can be assumed that an exemption is requested for “cadmium as an alloy component in silver-based brazing alloys as well as in silver-based contact materials”.

5.4.2 Summary of justification for exemption

The criteria for justification of an exemption named by the applicant refer to the following points:

- There are no suitable substitute materials with fully equivalent physical and mechanical properties (technical argument).
- Customers are not prepared to limit the use or fully eliminate application of cadmium-containing materials which might lead to serious difficulties to keep the applicant’s position on the market (economic argument).
- American customers are still interested in buying cadmium containing brazing alloys and cadmium containing contact materials. In order to be able to keep the same production volume it is requested to be allowed to continue producing the cadmium containing applications for two to three more years in order to avoid a reduction of employment level (economic argument).

The applications are not covered by the existing exemption no. 8 of the Annex to the RoHS Directive (see 2005/747/EC).

A critical review of data and information given by applicant and other parties has lead to the following observations and conclusions:

- No detailed technical justification is given by the applicant on the lack of available substitutes. It cannot be reconstructed why substitution is technically or scientifically impracticable.
- The economic argumentation is not in line with Article 5 (1) (b) of the RoHS Directive and can thus not be taken into account for a justification of the exemption request.
- The applicant himself states that substitutes are available for cadmium containing alloys: for contact materials such substitutes might be AgSnOBiO composite or AgNi or AgFe. These new grades of composites have already been offered to customers of the applicant and he expects that they will “increasingly often buy them instead of the AgCdO contacts”. For brazing alloys suitable substitutes might be AgCuZn alloys with some additives such as Si, Ni, Sn and Mn. These Cd-free alloys have already been produced and sold by the applicant.

Hence, there is no justification available being in line with Article 5 (1) (b) of the RoHS Directive.

5.4.3 Final recommendation

Following the above mentioned critical review it is recommended not to grant an exemption for this request due to the availability of existing substitutes as stated by the applicant himself.

Regardless of this recommendation some of the applications mentioned by the applicant (i.e. contact materials) might fall under an already existing exemption of the RoHS Directive (entry no. 8 of the Annex).

5.5 Lead in solder on small PCB and tinned legs of primary components – e2v (set 2 request no. 20)

5.5.1 Description of requested exemption

The applicant has required an exemption for lead as constituent in solders and finishes. It is used on small printed wiring boards (PWBs) in thermal imaging cameras converting an infrared signal into an electrical signal, in order to be displayed on a LCD display or other viewing sources. The device is a detector, which converts the infrared signal into small current values and a printed circuit board, which processes the small current values into the electrical signal. This pair, detector and printed circuit board, are known as the "microbolometer" or "camera engine".

During the time of the exemption, e2v uses around 100 mg in a camera of 2 kg weight, and less than 1 kg of lead totally per year in the application for which the exemption is requested.

The wording provided by the applicant is

"*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.*"

5.5.2 Summary of justification for exemption

According to the applicant the following argumentation is put forward for justification:

- Small amount of lead used
- Applicant successfully converted the product to RoHS compliance, besides the small PWB and the detector that contains lead in solder and component finishes
- The PWB is supplied by an US manufacturer. Although the applicant has requested supply of a RoHS compliant component, the manufacturer was not willing to provide such a redesigned PWB (supply chain argument).
- The applicant started redesigning the product as soon as it became clear that the supplier would not change the non-RoHS-compliant PWB.
- After the redesign, it will be possible to use a RoHS compliant alternative from European manufacturers.
- The fully RoHS compliant product will be available for sale around mid 2007.
- Product is essential for equipment for fire fighters and rescue teams in Europe and worldwide.
- Other producers of this product are all from the US. They will not change this product to a RoHS compliant version. As there are only two manufacturers in Europe including e2v, such products will then only be available from one European manufacturer, which will increase the price (economic argument).
- e2v's ability to further support the products already out on the market would be limited, with technical as well as warranty support, if the exemption is not granted. e2v would not be able to sell the non-compliant Thermal Imaging Camera (TIC) after the deadline and will not have a compliant version available in time. Therefore, without an exemption during this transition period, it is possible that e2v would not be able to supply any TICs in Europe and would have to withdraw from the market for a period of time (economic argument).
- It would not be viable for e2v to maintain the employee resource or the technical competence, if e2v can no longer sell these products. In terms of warranty support, if e2v cannot sell new cameras in the transition period before the new design is available, then the business may not remain viable for e2v. e2v would not be able to continue to support current customers and develop new products without the income provided by ongoing camera sales in the interim period (economic argument).

- A two year exemption period is adequate in order to ensure that there is enough time to complete all of the necessary development before putting the new Thermal Imaging Camera on the market.

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:

- A product redesign, which the company already has started, can avoid the use of the banned substance.
- There are no technical or principal logistical problems involved. The applicant started the redesign of the product too late to be ready for the deadline due to pending negotiations with the US manufacturer of the PWB.
- There is no technical necessity for this exemption.
- There are no principal logistical or technical problems involved, as the functionality of the PWB and the detector can be verified with RoHS-compliant components and materials.
- The new product will be available until mid 2007, according to the applicant. The argument for the exemption is not to interrupt the sales of cameras into the market. The requested 2 years time for the exemption is thus not justified.

5.5.3 Final recommendation

The applicant has started the redesign of the Thermal Imaging Camera and it will be available until mid 2007. If the exemption request is rejected, the applicant says he does not have a saleable product until mid 2007 and might have to withdraw from the market at least between July 2006 and mid 2007. He might not be able to fulfil his warranty obligations for the products already in the market. The applicant maintains that the price of these cameras might increase then due to a lack of competition on the European market.

Provided that this type of equipment is in the scope of the RoHS directive, from a technical, scientific or environmental point of view, the requested exemption is not justified. It is clearly not in line with Art. 5 (1) (b) of the RoHS Directive. Alternatives for the requested exemption are available, but the applicant started the redesign of the product part too late to be ready for the deadline in July 2006. As the device in question can be produced with RoHS compliant solders, finishes and components, and will only be used by the applicant in the European market, granting the exemption would establish a company specific, not an application specific exemption from the RoHS Directive.

It is therefore recommended not to grant this exemption.

5.6 Use of the not lead free component NEC V25 in the Memor 2000 – Datalogic (set 2 request no. 21)

5.6.1 Description of requested exemption

The applicant requests an exemption for the use of lead in solder paste and surface treatment on component legs of a specific type of microprocessor – the NEC V25. This component is used in a certain type of handheld computer (Memor 2000) produced by the applicant and mostly used for data collection device in warehouses and retail. The component is mounted on a printed circuit board. Lead is needed for that process since it lowers the melting point of solder tin necessary for the soldering of the specific component NEC V25 which cannot withstand higher soldering temperatures.

The normal content of lead in the solder paste is 35 – 40 %. The weight of the Memor 2000 printed circuit board (PCB) with it's components soldered in place is about 1%. The weight of the used lead on one PCB is thus about 0,25 grams.

The precise wording provided by the applicant[4] is not in line with the requested form for exemptions and can thus not be taken as basis for the evaluation. From the context of the information provided by the applicant it is assumed that the exemption is requested for

"lead in solder paste and surface treatment on component legs of the NEC V25 microprocessor used in the handheld computer Memor 2000".

5.6.2 Summary of justification for exemption

The applicant puts the following points forward as justification for the exemption request:

- No lead-free version of the microprocessor NEC V25 will be put on the market by the manufacturer (NEC) and no replacement for NEC V25 is available (supply chain argument).
- The available version of NEC V25 cannot withstand the higher solder temperature needed by lead free solder pastes (technical argument).
- If the Memor 2000 shall be replaced with another computer, it is very difficult to implement the software changes needed.
- Production of the Memor 2000 is still necessary after 1 July 2006, mainly to replace units that are no longer possible to repair.

[4] „The handheld computer Memor 2000 has been produced since 1995. To be able to support our customers with their installed base of handheld computers Memor 2000, Datalogic AB needs an exemption from the RoHS Directive regarding lead free soldering to guarantee production of the Memor 2000 and spare parts until July 1st 2008".

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 exemption request brought forward by the applicant is poorly justified: it is neither understandable why no substitute is available and why substitution is technically not feasible nor is it clear what efforts have been made to replace the lead containing microprocessor NEC V25.
- The applicant does not justify why a redesign of the application is not feasible (e.g. why the use of another microprocessor is technically not feasible).
- The applicant does not justify why selective soldering of the microprocessor (e.g. by hand in order to keep temperatures that do not damage the component) is not feasible.
- It has to be assumed that the application mentioned by the applicant (use of handheld computers for data collection) is also available in a RoHS compliant version since no other manufacturer of such products has requested an exemption. Furthermore the applicant has not justified why the use of the microprocessor NEC V25 is technically absolutely necessary for the application in it's handheld computer Memor 2000.
- Lead free soldering is technically feasible for mounting of microprocessors on printed circuit boards (PCBs). Hence there is no justification for an exemption of this specific application.

5.6.3 Final recommendation

According to the above mentioned points it is recommended not to grant an exemption for the requested application of lead containing soldering of the microprocessor NEC V25 on a printed circuit board for the use in the handheld computer Memor 2000 since there is no justification on technical/scientific impracticability of available substitutes or redesign of the application.

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

5.7.1 Description of requested exemption

The applicant 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*"

5.7.2 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 is currently underway to get their statement on this issue (alternatives they might have investigated, confirmation or opposing opinion regarding the fact stated by Sumitomo, own RoHS compliance strategy regarding this specific application).

5.7.3 Final recommendation

Based on the information given by Sumitomo and Cookson Electronics an exemption seems to be justified, but a response by the competitor Raychem / Tyco Electronics is needed before a final recommendation can be given.

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: Questions to 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 (set 2 request No. 5)

- The FAQ document of the European Commission (http://europa.eu.int/comm/environment/waste/pdf/faq_weee.pdf) clarifies, that "large-scale stationary industrial tools [which are exempted from the RoHS] are machines or systems, consisting of a combination of equipment, systems, finished products and/or components, each of which is designed to be used in industry only, permanently foxed and installed by professionals at a given place in an industrial machinery or in an industrial building to perform a specific task. Not intended to be placed on the market as a single functional or commercial unit." Example given: "Oil platforms". Taking this definition into account, would you classify your product being part of a "large scale industrial tool"?
- Your request refers to "solder containing lead and / or cadmium…". From the justification given by you it is likely, that cadmium is not subject to your request for exemption. Please, confirm.
- In case the exemption is granted, the wording of the exemption has to be focused more on the "specific application". Would the following suggested wording cover your intended "specific application": "Solder containing lead for in-situ oil and gas prospection and exploration equipment intended to work in environments where local temperature is higher than 150 deg C for more than 500 hours" In case this wording does not cover your request for exemption, please, suggest another specific wording.
- A lead-free solder for the mentioned temperature range and with a similar melting point is SnSb5. Please, provide information if you have evaluated the application of this solder for your specific application and if it is feasible for the mentioned application.
- You state, that with high tin material the formation of whiskers is increasing. This might be specifically a problem for fine pitch applications. Please state the current minimum pitch of the electronic assemblies.
- Do you currently investigate lead-free alternatives further and is it likely that a feasible alternative is available mid-term (in about 2 years)? Please explain your strategy, if no exemption is granted.
- You state, that you consume less than 50 kg of lead per year. Please, state how much of this is of relevancy for the European Union.

- Are you aware of any competitors with similar equipment, which are likely to face the same compliance problems? Please, state the names of these competitors.

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

- Please, give a precise definition for “high-powered”. To formulate an exemption requires an unambiguous wording, which clearly provides guidance, which equipment is exempted and which equipment is not exempted. Is the SPL (sound pressure level) from your point of view an appropriate parameter to make this difference? And what would be the suggested threshold? From your justification a threshold of “designed for a maximum of 125 db SPL 1W/m and above” might be applicable. Please confirm or suggest a different wording.
- Please, provide a schematic drawing or photo of the solder joint and transducer system (copper-clad aluminium / copper voice-coils / tinsel wires) for further clarification.
- You state a figure of 0.19 g lead per transducer. Please state the approximate number of transducers/loudspeakers Meyer Sound sells on the European market (and falling under the “high-powered professional” definition). Please also give an estimation for all such products on the European market (not only from Meyer Sound but also from your competitors, maybe based on market share figures).
- In your request for exemption as of April 2005 you state, that Meyer Sound “intends to explore and evaluate different lead-free alloys as potential substitutes” and that you do not know “whether a substitute will be available by July 1, 2006”. Please, give an update on this statement: Which investigations with which alternatives have you undertaken by now and what are the results of these investigations? Is it known in the meantime, if a substitute will be available in time or when do you expect that there might be an alternative available?

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

- The quantity of 20 kg of lead you indicated is for Europe, or globally in case the exemption is granted?
- What is the amount of cadmium involved in your exemption request in Europe (also globally, if available).
- Is the list of low melting alloys in the document “statement-stannol.pdf” complete? Are there other low melting point alloys?
- Why do you need exactly the melting points 96, 124 and 145 C? Why is it not possible to use RoHS compliant alloys that are technically appropriate with similar melting

points, if necessary after a redesign of the product? It is well understood that you need alloys with a well defined and narrow melting point for your application to ensure a reliable safety function. However, not all RoHS-compliant alternatives are non-eutectic alloys.

- Besides the possibility that there might be other RoHS compliant alternatives (see question 3), what about the Bi58Sn42 alloy? It is not commented in the document why this cannot be used assuming that you do not necessarily need exactly the melting points you quote. Please be aware that having a patent on some application is NOT a viable argument for requesting an exemption. The RoHS Directive considers the redesign of devices as reasonable , as otherwise everybody would be entitled to have an exemption and the legislation would be without any effect.
- It is not clear from the documentation you submitted why indium containing RoHS compliant alloys are not appropriate for your application, possibly after a redesign of the product to adapt it to the different melting points. Please provide appropriate information proving that these alloys principally are technically inappropriate.
- You mention internal tests showing that some alloys are not appropriate. Please provide these tests and explain the results.
- Can the use of an alternative technology completely avoid the necessity to use thermo fuses? Please explain, in case, why this is not a viable possibility for you to be RoHS compliant with your products.

Annex 2: Withdrawals of requests by applicants

Lead in solder for printed circuit boards for emergency lighting products – LIF (set 2 no. 6)

From:"Bernard Pratley" <Techman@lif.co.uk>
To:<rohs@oeko.de>
Subject:RE: (Fwd) Clarification needs exemption request RoHS No. 6 [Scanned as virus free]
Date sent:Tue, 20 Dec 2005 11:56:11 -0000

Dear Stéphanie Zangl,

Please note that we will not be pursuing this claim for an exemption.

Thank you for your interest,

Bernard Pratley,

Technical Manager,

Lighting Industry Federation Ltd. (www.lif.co.uk)

Registered office: Swan House, 207 Balham High Road, London, SW 17 7BQ.

Tel: 0208 772 9481 Mobile: 07802 306 563

This email and any files transmitted with it are private and intended solely for the use of the addressee. This email does not constitute a commitment by LIF.

Electrical and electronic components contained in heating ventilating and air conditioning building systems, commercial refrigeration systems and transport refrigeration systems – Carrier (set 2 no. 12)

"ROLLET, Pierre-Yves" <Pierre-Yves.ROLLET@carrier.utc.com>
To:rohs@oeko.de
Subject:TR: (Fwd) Clarification needs exemption request RoHS No. 12
Date sent: Wed, 21 Dec 2005 16:14:14 -0500
Dear Mrs Zangl:

Thank you for your email and please apologize for the late answer.

The essential point of our request made in February was that we view the applications mentioned in our letter to be outside the scope of WEEE Directive and thus the RoHS Directive. The letter was also primarily sent in relation to internal Commission discussions (between DG Environment and the Legal Service) on the scope of RoHS last December/this January, where we were concerned that the scope of RoHS could be wider than the scope of WEEE. Following these discussions on the scope of RoHS and the publication in May this year of "guidance" by the Commission on the scope of RoHS, we were of the view that this question of scope had been addressed, that is,

that electrical equipment used in modes of transport (e.g. refrigerated transport), and/or are part of installed systems like air conditioning and refrigeration systems for buildings and supermarkets (i.e. not purchased as "finished" products or "articles") are indeed outside the scope of WEEE/RoHS.

I hope that this is also your understanding following the intention of the WEEE directive to prevent waste from households and "non-households" from entering the municipal waste stream and thence to landfill. None of the equipment in our request would enter this waste stream and we would be very worried if the Commission is now reconsidering its views regarding scope as set out in guidance document. If the issue is being reconsidered in relation to our request, I would greatly appreciate hearing more on the matter.

If you have any questions, please do not hesitate to contact me.

Pierre-Yves Rollet
Co-gérant
Carrier scs
Montluel, France

Tel +33 4 72 25 23 33

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 (set 2 no. 15)

From:"Nicolle, Darcy R UTCHQ" <Darcy.Nicolle@corphq.utc.com>
To:'"rohs@oeko.de"' <rohs@oeko.de>
Subject:RE: (Fwd) Clarification needs exemption request RoHS No. 15
Date sent: Fri, 9 Dec 2005 06:37:49 -0500

Dear Sir/Madam,

Thank you for your email. The essential point of our request (No. 15) made in March was that we view the applications mentioned in our letter to be outside the scope of WEEE Directive and thus the RoHS Directive. The letter was also primarily sent in relation to internal Commission discussions (between DG Environment and the Legal Service) on the scope of RoHS last December/this January, where we were concerned that the scope of RoHS could be wider than the scope of WEEE. Following these discussions on the scope of RoHS and the publication in May this year of "guidance" by the Commission on the scope of RoHS, we were of the view that this question of scope had been addressed, that is, that electrical equipment used in modes of transport, and/or are part of systems (i.e. not purchased as "finished" products) are indeed outside the scope of WEEE/RoHS.

I hope that this is also your understanding following the intention of the WEEE directive to prevent waste from households and "non-households" from entering the municipal waste stream and thence to landfill. None of the equipment in our request would enter this waste stream and we would be very worried if the Commission is now reconsidering its views regarding scope as set out in guidance document. If the issue is being reconsidered in relation to our request, I would greatly appreciate hearing more on the matter.

If you have any questions, please do not hesitate to contact me.

Darcy Nicolle
United Technologies
U Telephone: +32 (0)2 739 49 01
T Facsimile: +32 (0)2 732 97 70
F E-mail: Darcy.Nicolle@utc.com

Lead used in shielding of radiation for Non Medical X-ray equipment – l3com (set 2 no. 22)

From:"Edwards, Greg" <Greg.Edwards@l-3com.com>
To:'"rohs@oeko.de"' <rohs@oeko.de>
Subject:RE: Clarification needs exemption request RoHS No. 22

Date sent: Mon, 12 Dec 2005 10:57:26 -0500

Dear Sirs, L3 Security and Detection Systems, Woburn, MA will base our approach to the WEEE and Rohs directives as an exempt product as we fall into the Category 9 of the WEEE directive. L-3 Security and Detection Systems is a leading supplier of X-ray security screening systems and metal detectors - offers a broad array of products to the aviation, transportation, and public building security markets. We screening packages for explosives, firearms, contraband, and drugs in the vast majority of all commercial airports, jails, postal facilities, and government buildings.

We have also utilized a consulting firm Design Chain Associates, that support our position as being exempt per the section 9, WEEE directive.

We wish to withdraw our exemption request: lead used for radiation shielding in security x- ray screening systems (No. 22)

Sincerely,

Gregg Edwards
Regulatory Engineer
L3 Communications
Woburn, MA
781-939-3800 x 1704

Annex 3: Product description of silicon-based photodiodes

Visible Light Detector with Analog and Digital Outputs (413101)

(see attached file “SF 413101CdS replacement IC.pdf” and “SF 413101 4pin Layout.pdf”)

Visible Light Detector (412101)

(see attached file “SF 412101 CdS replacement IC.pdf” and “SF412101 layout plot.pdf”)