



European  
Automobile  
Manufacturers  
Association



JAPAN AUTOMOBILE MANUFACTURERS ASSOCIATION, INC.



한국자동차산업협회  
Korea Automobile Manufacturers Association

“7th Adaptation to scientific and technical progress of exemptions 8(e), 8(f), 8(g), 8(h), 8(j) and 10(d) of Annex II to Directive 2000/53/EC (ELV)”

To:  
Öko-Institut e.V. – Institute for Applied Ecology,

Via Email: elv@oeko.de

Submission of ACEA, CLEPA, JAMA, KAMA<sup>1</sup> et al. representing the affected automotive industry including the supply chain to the stakeholder consultation of 9 September 2013

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<sup>1</sup> All associations are registered at the EU Transparency register as follows:

European Automobile Manufacturers Association (ACEA) Identification No. 0649790813-47

European Association of Automotive Suppliers (CLEPA) Identification No. 91408765797-03

Japan Automobile Manufacturers Association, Inc. (JAMA) Identification No. 47288759638-75

Korea Automobile Manufacturers Association (KAMA) Identification No. 72944376512-60

## **0. Foreword**

This document provides the consolidated stakeholder submissions of the automotive associations ACEA, CLEPA, JAMA, KAMA, and associated industrial stakeholders to the “7th Adaptation to scientific and technical progress of exemptions 8(e), 8(f), 8(g), 8(h), 8(j) and 10(d) of Annex II to Directive 2000/53/EC (ELV)”. In the entry specific submissions the names of the participating associations are listed separately.

The Consultation was announced on 9 September 2013 and concludes on 4 November 2013 and addresses the following entries to be reviewed:

- 8(e) Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead)
- 8(f) Lead in compliant pin connector systems
- 8(g) Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages
- 8(h) Lead in solder to attach heat spreaders to the heat sink in power semiconductor assemblies with a chip size of at least 1 cm<sup>2</sup> of projection area and a nominal current density of at least 1 A/mm<sup>2</sup> of silicon chip area
- 8(j) Lead in solders for soldering in laminated glazing
- 10(d) Lead in the dielectric ceramic materials of capacitors compensating the temperature-related deviations of sensors in ultrasonic sonar systems

For all entries, except entry 8j, the following data for vehicles registered in EU 27 and the year 2012 were used as basis for quantity calculations:

12.053.904 Passenger Cars (M1) and  
1.377.283 light commercial vehicles (N1).

## **1. Introduction**

The automobile industry actively supports environmental policy efforts to design products free of hazardous substances and as environmentally sound as possible. All car manufacturers and actors in the supply chain have set up internal goals and environmental guidelines relating to products as well as production processes.

The automotive industry and their associations accept their product responsibility in full, but stress the need for proportionate actions or initiatives. They agree upon the minimisation of negative environmental impacts during all phases of a vehicle life. In order to reach this common goal to manufacture, market, operate service and recover products with as little as possible impact on environment or human health, the exact environmental impact, the

relevance of certain substances and their technical and economical implications need to be understood prior to mandating substance restrictions.

As self-responsible partners of the manufacturers, the suppliers are affected in a special way, having to deal with their global supply chain, sometimes down to the raw material basis.

## 2. Achieved progress in heavy metals reduction

The automotive industry has been continuously reduced the amount of lead necessary for the production of vehicles since the year 2000. Figure 2.1 pictures a schematic survey on the progress achieved. It shows the reduction profile of heavy metals used in vehicle production starting in the year 2000 until 2013. (Please note that the vertical axis is not linear for visualisation reasons).

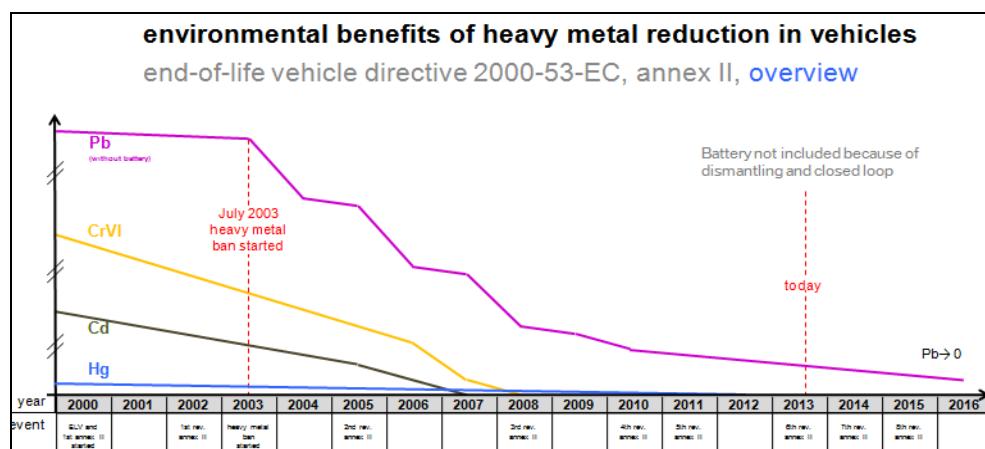


Figure 2.1: Development of lead used in the production of vehicles

**From 2000 to 2008, as stated in an independent Oeko-Institute study from 2010, life cycle related lead emissions have been reduced by 99.6%.**

### 2.1 Lead reduction in electrical applications since 2008 and technical aspects

Wherever possible lead substitution has been undertaken and the quantities required for production have been reduced by, for instance reducing the size of components and/or integrating functions. As far as possible, development of new electrical components is linked with the intention to be lead-free in general.

After the big reductions have been realized by generalised alternation of materials or technologies the very small remaining rest of total intentionally used lead now has come to a stage where further lead reduction is very difficult and many times needs a specific validation on component and vehicle level. Meeting the reliability demands of vehicle electronic components in particular over a period of 10 to 20 years and under harsh conditions has become a key issue and slows down the application of new lead-free developments. The simulation of effects from lead-free solders is subject of much academic research studies but cannot be a substitute for component testing.

No compromises are possible if issues of reliability, durability, safety or security are impacted by lead -free solutions. As a prerequisite, electronic components used for automotive

electronics have to be qualified by AEC-Q<sup>2</sup> specifications, which set enhanced demands on ageing, reliability and endurance.

For several components the exemptions for the use of lead are still essential, even if the first pilot projects now show sufficient results. Lead reduction programs have, as said before, now come to a level where component by component steps have to be made.

The main challenges are limited process temperature windows for production and the high thermo-mechanical load on components during their use in a vehicle. In addition the continuously ongoing miniaturisation of electronics influences and limits possibilities.

Nevertheless further progress could be made in the introduction of lead-free soldered printed electronic circuit boards (PCB), which is an ongoing step-by-step process by component by component. Please reflect that the lead content of the solder on the PCB contributes the predominant amount of lead in solder, whereas the lead content of the electronic components is marginal.

Entry 8d will not require further extension. A substitution for this application was developed for new vehicles and will be phased-in in time. Solutions for phasing out entry 8c (Lead in finishes on terminals of electrolyte aluminium capacitors) were found and are being applied continuously. For entry 8h we are confident of being able to phase in a lead free substitute for vehicles type approved after 1 January 2016.

Further investments in the substitution of lead under the remaining exemption will fail to have a significant positive effect on the waste stream of future end-of-life vehicles.

In our opinion, the marginal remaining quantity of lead in electronics is not harmful to the environment in either the production phase or in use phase of a vehicle. The E/E components in a vehicle do not leach otherwise dissipate lead into the environment.

### **3. Further comments to stakeholder contribution**

Where possible and necessary our search for lead-free alternatives was supported by external expertise but without public funding over the last few years. This included examples such as the DA5 project or a press fits R&D project.

Please appreciate that the mandating, financing and conduct of external studies needs much more than the 8 week period granted for the stakeholder consultation. Eight weeks are challenging for a consultation with specific questions affecting an industry with a complex and long supply chains and we may have received some answers from the suppliers not in time. We are surprised that every stakeholder request needs to be supported by external expertise, as postulated in the consultation document from 9 September 2013. Our working groups are supported by well educated and excellent experts with external acknowledged expertise in the vehicle but as well E&E or glass / ceramic industry. For instance automotive glass expertise and know how is located with the glass suppliers which have the highest competence in that field. This is why we reject the general request to seek external expertise.

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<sup>2</sup> See <http://www.aecouncil.com/index.html> defines common electrical component qualification requirements

The replacement of lead solder in laminated glazing and the addressed E/E components is still impossible today for all requested applications, and therefore exemptions need to be granted.

For some of the applications, exemptions exist under the RoHS regime. Some existing, tested and validated electronic components work well in consumer goods, while the test and validation for implementation into our vehicles production without risks for safety and reliability of our products is not yet finalised.

The outcome of our common assessments resulted in several exemptions for lead being in the scope of this stakeholder consultation, but that need to be continued without limitations. Solutions for substitutes are not or not yet feasible for complete volume production, given as of the knowledge of today.

In conclusion, the automotive industry requests the extension of the exemptions as specified in the attached documents.

Cutting these exceptions may have a significant impact on the phase-in of CO2 reduction technologies, such as the new generation of hybrid vehicles, electric vehicles, or future vehicle navigation and communication systems; development and release will be slowed down as important components are not available.

The continued improvement of the overall environmental performance of vehicles and their production processes requires that we also assess the environmental performance of substitute materials in order to allow long lasting decisions for optimised materials in each application.

The entire industry, however, needs a reliable planning basis for these substitute materials for at least one development cycle of a vehicle. This needs to be considered in any future phase out recommendation and plans and EU Commission decisions.

Attached you will find the submissions with technical justifications compiled by expertise of the entire automotive industry (together with the E/E, semiconductor, glass suppliers etc. industry) regarding lead in solder and ceramic capacitors, based on the current knowledge.

The automotive industry would like to remind all decision makers in this subject that the still ongoing economic down-turn in many European countries is massively impacting in particular our industry.

In this context it should be noted that the automotive industry input is completely based on the assumption that there are neither restrictions in our cycle plans nor our R&D spending due to the ongoing effects of the financial crisis.

The automotive industry therefore calls on all decision makers to apply the principles of proportionality when enforcing legislation in line with better regulation policies as set out in the CARS 2020 initiative. With interest we noticed the criteria of fitness checks currently applied to several waste directives based on the priority waste stream program from the early 1990s. As we understood effectiveness of measures and targets will be scrutinised.

The entire automotive industry would welcome the opportunity to continue the open discussions with the Commission and the consultants also during the assessment process of the consultation input and can provide further information on the subjects on demand.

We would like to ask you, to address your requests for further information to the listed contact partner below in written procedure and always to send a copy to the below listed associations representatives.

Best regards



Peter Kunze



Reinhard S. Hoock

On behalf of the Joint Industry Associations and the associated industry stakeholders

Enclosures:

Submission for entry 8e

Submission for entry 8f

Submission for entry 8g

Submission for entry 8h

Submission for entry 8j (two files)

Submission for entry 10d

### **Contact details of the representatives of the associations**

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