EUROPEAN ALUMINIUM

RoHS Exemption 6b Response to Oeko-Institute 1st Questionnaire

Name and contact details

Name and contact details of responsible person for this application & response:

Company: European Aluminium Association (AISBL)
EU Transparency Register No: 9224280267-20

EUROPEAN ALUMINIUM

Name: Magdalena Garczynska
Function: Recycling Director
Tel.: +32 2 775 63 58
E-Mail: garczynska@european-aluminium.eu
Address: Avenue de Broqueville, 12
BE 1150 Brussels - Belgium

This response to the 16-July-2015 Oeko-Institute questionnaire is submitted on behalf of European Aluminium and the participating industry associations and companies listed below.

DIGITALEUROPE

DIGITALEUROPE
EU TR No: 64270747023-20

ceced

European Committee of Domestic Equipment Manufacturers (CECED)
EU TR No: 04201463642-88

EECA EPCIA
European Passive Components Industry Association

European Passive Components Industry Association (EPCIA)
EU TR No: 22092908193-23

ESIA
European Semiconductor Industry Association

European Semiconductor Industry Association (ESIA)
EU TR No: 22092908193-23

EUROPEAN ALUMINIUM

RoHS Exemption 6b Response to Oeko-Institute 1st Questionnaire

Gesamtverband der Aluminiumindustrie e.V.

Information Technology Industry Council (ITI)
EU TR No: 061601915428-87

European Garden Machinery Industry Federation (EGMF)
EU TR No: 82669082072-33

LightingEurope
EU TR No: 29789243712-03

ZVEI - Zentralverband Elektrotechnik- und Elektronikindustrie e.V.
ZVEI - German Electrical and Electronic Manufacturers´ Association
EU TR No: 94770746469-09

Note: 'EU TR No' is the EU Transparency Register

Questions and answers

Question 1:

RoHS Exemption 6b Response to Oeko-Institute 1st Questionnaire

Please specify the components made from leaded Al alloys that are used in Electrical and Electronic Equipment (EEE).

a. Please specify which components make use of wrought alloys (in cases where lead is intentionally added for reasons of better machinability) and in which components use of cast alloys is made (where lead is unintentionally present due to the use of Al scrap/ recyclate).

b. Can you indicate the share of lead placed on the EU market in total through such applications, as well as the respective share of use of cast alloys and of wrought alloys?

Answer:

The applications of Al Alloy (wrought and casting alloys) vary from one component to another. The use of the alloys is not strictly limited to a specific application in a component. Usually components producers design a component and specify the type of alloys they want to use to a supplier. There are hundreds if not thousands components may use Al alloys. Lead is added to wrought alloys to improve their machinability, and these alloys are often used in screw machine products, e.g. various machinery components, screws, bolts, fittings, nuts, automatic lathe products.
For these reasons, it is not possible to estimate or even guess the amount of lead placed on the market through the Al alloys.

Question 2:

During the recent revision of the corresponding exemption under the ELV Directive 2000/53/EC (ELV, Annex II, Ex. 2(c)), the automotive industry and European Aluminium stated:

"Since last stakeholder consultation, a slight reduction of the average Lead amount introduced by recycling could have been recognized. This can be explained by larger shares of the cars/industrial goods that will be recycled has been produced under Lead restrictions."

a. Please explain whether the same is true for WEEE recycling and whether all Al scrap is collected and treated together (or alternatively if applications from different sectors are collected and treated separately).
b. Can you provide information regarding the average lead content related to Al alloys that enters in WEEE recycling mechanisms?

Answer:

a. This decreasing trend observed in the recycling of ELVs is not yet visible in the case of EEEs. Compare to Al scrap from ELVs, the amount of Al scrap from EEE is much smaller. Also, most of the Al scraps from EEE

waste, though maybe collected and treated separately, are recycled together with other Al scraps. This could be the main reason that the change of Pb content is not so visible in the case of WEEE.

b. As reasoned in the answer to question 1, it is not possible to make such estimation.

Question 3:

Regarding the intentional dilution of recycled Al with primary Al you state: "This would result in higher environmental impacts due to the fact that the production of primary aluminium is very energy intensive."
How does this correspond to statements in the literature (e.g. Gaustad et al. (2012) , Paraskevas, D. et al. (2013)) that impurities in aluminium recycling are regularly compensated by dilution with purer aluminium fractions or with primary aluminium in order to reach specified product quality?

Answer:

There is a good correlation between the two statements. It can well be the case for some secondary Al producers who recycle scrap with certain impurity. For example, in the case of lead, many casting alloys has standard for lead to be less than 0,4%. When lead content is high in the input scrap material, to achieve the 0,4%, low lead Al scrap or primary Al has to be added to the molten metal to dilute the lead content. An ingot produced by scraps that needs adding primary Al for dilution will have a higher environmental impact than an ingot produce purely from scrap material. However, such production is necessary in our society since metal scraps should be recycled rather than discarded.

As explained, if 0,4% is lowered or removed, more primary Al would be needed for dilution in order to recycle scrap with high lead contamination.

Question 4:

In your application it is stated that "It has been experienced and discussed within the secondary aluminium producers that bismuth creates an unwanted microstructure effect leading to potential problems in the refining and casting process. Thus bismuth alloys (if in large amount) need to be separated from the others for remelting."
Nonetheless, according to publically available material datasheets, it is understood that the lead free Al alloys AlEco62Sn as well as AA 6023 contain bismuth.
According to the automotive industry (ACEA et al. 2014), it is also further understood that these alloys are already used in the automotive sector ("Some applications of 2011 alloy have even been changed as far as possible to a lead free alternatives e.g. AlEco62Sn or AA 6023."). It is thus understood that bismuth containing Al alloys are already entering the recycling stream and it is subsequently expected that the recycling operators are adopting their mechanisms respectively.

Please explain against this background how Al recyclers process bismuth containing alloys and how they expect to do this in the future?

Answer:

Here, first we would like to emphasis again that Bismuth is not seen as an appropriate general substitute for lead due to environmental issues apart from the technical problems, as both have been described in the application file. As stated in the application for 6b, section 8C 'Availability of the substitute': 'As a raw material bismuth mainly arises as a by-product during the refining of virgin lead. In China, it is a by-product of tungsten ore processing. Typically, 30 to 200 tons of lead is produced to obtain 1 ton of bismuth'. RoHS exemption 6(b) allows a maximum lead content in aluminium of 0.4%. As stated in the foot notes the bismuth content is 0.4 to 0.9% for AlEco62Sn and 0.3 to 0.8% for AA 6023. Thus bismuth with up to double the amount of lead in the original alloys is needed for the production of the substituting alloy. Without its own primary production and as a by-product of lead, bismuth cannot be seen as substitute for lead, as also concluded in the mentioned ACEA document.

Thus the citations given in the question may not be misunderstood in that way that bismuth containing alloys are used in higher amount as alternative for the original alloys.

In practice, companies are very careful with assessing their input material and make sure that the Bi content is within the limits specified in the EU standard. If the Bi content is higher than processing limits, the material is diluted with, in most cases, primary aluminium. So far, there have been very few cases where Bi content is relatively high. No company has expressed their expectation of regular high Bi content in the future.

Question 5:

Please explain in more detail why you are not able to provide an estimation for the amount of RoHS substance (Pb) placed on the market each year through the applications in EEE relevant for Exemption 6(b).

Answer:

- In order to make such estimation from a 'direct' approach, one needs to know all the EEE products/components, on the EU market, that contain aluminium and among them which alloys containing lead their respective quantity. There is no such information available.
- From an 'indirect' approach, data on world lead containing Al alloys production is needed and of which what would be the share of such alloys goes to the EEE production sector. Furthermore, one needs to know the EU market (consumption) share of the world EEE production.

The European Aluminium association has data and information showing the amount of wrought products, extruded products and secondary alloys shipped to the EEE and machinery sectors (consumption) from EU producers. However, there is no data available concerning which of these products/alloys contain lead and their quantity. Furthermore, no data available indicates that the amount of final EEE products produced using EU Al alloys is actually placed on the EU market. Even more, such estimations would be even more difficult to make for other world regions in order to draw conclusion for the whole EU market.

Questions 6:

Please indicate the efforts your organisations have made since the last revision of Exemption 6(b) to find and implement lead free Al alloys.

Answer:

In 2012-3, the Aluminium industry has carried out a research project on possible technologies to remove lead during the refining process of aluminium scrap. It has concluded no such technologies will become available in the near future. The study report is part of the application dossier.

Questions 7:

Can you provide a roadmap for substitution, which details the various stages that need to be carried out once a candidate is identified in order to develop a substitute substance/technology up to the stage that products without the relevant RoHS substance can be made available on the EU market?

Answer:

Given the fact that there is no suitable alternative, it is impossible to draw up any detailed road map at this stage.