

Consultation Questionnaire Exemption Request No. 2017-1

Exemption for „Lead in solder used to make electrical connections to vacuum boards used in Mass Spectrometers. Boards designed to be used periodically under low pressure“ for five years

Abbreviations and Definitions

Pb	lead
Sn	tin
Bi	bismuth
PCB	printed circuit board

Background

The Oeko-Institut and Fraunhofer IZM have been appointed by the European Commission, within a framework contract¹, for the evaluation of applications for exemption from Directive 2011/65/EU (RoHS 2), to be listed in Annexes III and IV of the Directive.¹

AB Sciex has submitted a request for the above mentioned exemption, which has been subject to a first completeness and plausibility check. The applicant has been requested to answer additional questions and to provide additional information, available on the request webpage of the stakeholder consultation (<http://rohs.exemptions.oeko.info/index.php?id=276>).

According to the applicant, there is currently no substitute or technological alternative to the use of lead in solders (composed of Sn 63 %, Pb 37%, Sn63Pb37) used to make electrical connections (connectors to PCB) at the interface between the internal vacuum chamber and the detection section of Mass Spectrometers. Trials with lead-free solders have resulted in vacuum leaks via cracks at solder joints in multiple locations. Those failures were attributed to the higher melting point of lead-free solder. The exemption is requested due to the low temperature melting point of the Sn63Pb37 solder, which attributes to the reliability and integrity of the interconnect joint. Alternative solutions are currently under investigation. These include surface mount interconnect and low temperature bismuth based solder. According to the applicant, the surface mount interconnect solution is promising, but is not expected to be ready for market before the year 2022. Bi-based solders are not yet established under a low pressure environment, and may also not be ready before 2021/2022.

For details, please check the applicant's exemption request at:
<http://rohs.exemptions.oeko.info/index.php?id=276>

¹ The contract is implemented through Framework Contract No. FWC ENV.A.2/FRA/2015/0008 of 27/03/2015, led by Oeko-Institut e.V.

The objective of this consultation and the review process is to collect and to evaluate information and evidence according to the criteria listed in Art. 5 (1) (a) of Directive 2011/65/EU (RoHS II), which can be found under:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32011L0065:EN:NOT>

If you would like to contribute to the stakeholder consultation, please answer the following questions:

Questions

1. The applicant has requested an exemption, proposing the following wording formulation:
“Lead in solder used to make electrical connections to vacuum boards used in Mass Spectrometers. Boards designed to be used periodically under low pressure.”
 - a. Do you agree with the scope of the exemption as proposed by the applicant?
 - b. Please suggest an alternative wording and explain your proposal, if you do not agree with the proposed exemption wording.
 - c. Please explain why you either support the applicant’s request or object to it. To support your views, please provide detailed technical argumentation / evidence in line with the criteria in Art. 5(1)(a) to support your statement.

2. Please provide information concerning possible substitutes or developments that may enable reduction, substitution or elimination, at present or in the future, of *“Lead in solder used to make electrical connections to vacuum boards used in Mass Spectrometers. Boards designed to be used periodically under low pressure”*;
 - a. In this regard, please provide information as to alternatives that may cover part or all of the applicability range of *the application*;
 - b. Please provide data as to application specifications to support your view.

3. Please provide information as to research initiatives that are currently looking into the development of possible alternatives for some or all of the application range for which the exemption is requested.
 - a. Please explain what part of the application range is of relevance for such initiatives (in what applications substitution may be possible in the future).
 - b. Please provide a roadmap of such on-going research (phases that are to be carried out), detailing the current status as well as the estimated time needed for further stages.

4. AB Sciex provided the below list of other manufacturers of mass spectrometers in the EU market.
 - a. Agilent

- b. Applied Biosystems
- c. Bruker
- d. Hitachi High Technologies
- e. IONICON
- f. JEOL
- g. LECO
- h. PerkinElmer
- i. Shimadzu
- j. Thermo Fisher Scientific
- k. Waters

Are you aware of other manufacturers of mass spectrometers in the EU and outside the EU?

5. There are other manufacturers delivering mass spectrometers (see above), which have not applied for an exemption.
 - a. Please state whether you manufacture a similar type of mass spectrometer and whether the same or another type of feedthrough is employed in your equipment.
 - b. Does your solution require the use of lead?
 - c. Can you confirm that the use of PCB as electrical feedthrough improves the signal integrity as compared to more conventional welded or potted feedthroughs?
6. The applicant estimates the lead quantity which would be used under the exemption in AB Sciex to be 26 g per year, based on current shipping products and volumes. The total amount of lead used by all manufacturers of mass spectrometers under the requested exemption is not known to the applicant.
 - a. Please indicate a range for the amount of lead in the EU and worldwide under the requested exemption.
 - b. Please provide a rough calculation to support your assumption for the above value.
7. Please provide an estimate of possible impacts on employment in total, in the EU and outside the EU, should the exemption not be granted. Please detail the main sectors for which impacts are expected, i.e. manufacturers, supply chain, retail, etc.
8. Please estimate

- a. the total volume of EEE affected by the exemption.
 - b. additional costs associated with a forced substitution should the exemption not be granted, and how this is divided between various sectors (e.g. private, public, industry: manufacturers, suppliers, retailers).
 - c. additional waste generated should the exemption not be granted.
9. Please estimate additional costs associated with a forced substitution should the exemption not be granted, and how this is divided between various sectors (e.g. private, public, industry: manufacturers, suppliers, retailers).

In case parts of your contribution are confidential, please provide your contribution in two versions (public /confidential). Please also note, however, that requested exemptions cannot be granted based on confidential information!

Finally, please do not forget to provide your contact details (Name, Organisation, e-mail and phone number) so that Oeko-Institut/Fraunhofer IZM can contact you in case there are questions concerning your contribution.