

Questionnaire

Review of Exemption 32 Annex of Directive 2002/95/EC

“Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes”

Background

Following Article 5 (1) (b) of the RoHS Directive (2002/95/EC), exemptions have to be reviewed at least every four years. **Exemption 32** is therefore now open to review with a view to adapt it to scientific and technical progress.

Coherent had applied for this exemption in 2006 (Coherent et. al 2006). Öko-Institut e.V together with Fraunhofer IZM had recommended granting the exemption (Gensch et al. 2006). The exemption was consequently approved during the decision-making process and came into force in January 2008 without an expiry date with the following wording:

“Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes”

The applicant justified the exemption request with the following main arguments (Gensch et al. 2006):

- Despite years of ongoing development the applicant has no feasible substitute for the use of lead oxide. Due to intractable constraints on the manufacturing process’ temperature and on the properties and composition of the window bonds it is technically and scientifically impracticable to exclude lead-containing seal frit from the manufacture of their products.
- Lead-free frit materials (e.g. bismuth- or phosphorus-based glasses) are in the exploratory stage and not developed technically or commercially to be a viable alternative for the applicant.
- Optical contacting as an alternative approach was considered. Due to the high requirements (axial alignment of the window) it was not possible to achieve better than 50 % yield (compared to 97 % yield with the current frit process).

For further details, please refer to Gensch et al. (2006).

In case you wish to either support the continuation or the withdrawal of the current **exemption 32**, please answer the questions in the next section. We also welcome any additional information illustrating the use and possible substitution of the hazardous substance in this application.

Questions

1. In which RoHS-relevant applications / equipments are argon and krypton lasers tubes used and where exactly are the lead-oxides located in the seal frits?
2. Please also provide an estimate of the annual quantities of the lead used in these particular applications covered by the RoHS Directive put on the market in the EU27.
3. Please indicate the functionality and technical necessity of the lead in seal frits used for glass panel assembling for Argon and Krypton laser tubes. Furthermore give examples of processes for sealing elements with glass solders in RoHS-relevant applications respectively list all relevant applications or group of applications that fall under the scope of the RoHS Directive that use these lead-containing glass solders.
4. At the time of the last evaluation, four years ago, no feasible substitute was available for the use of lead oxide in these seal frits. Is this statement still correct and if yes, why is substitution still technically and scientifically impracticable? Please provide detailed and fact-based evidence on what research has been done and what the outcome was to support your argumentation.
5. What is the current situation with the use of lead-free (e.g. bismuth- or phosphorus) based glasses for making window assembling for argon and krypton laser tubes? Please refer to relevant studies or other evidence on research efforts and outcome of substitution feasibility.
6. Are there any other technologies for sealing/contacting (e.g. thermal combination or optical contacting) the argon and krypton laser tubes? If yes, please provide what research has been done and what the outcome was.
7. Please indicate if the negative environmental, health and/or consumer safety impacts caused by substitution are likely to outweigh the environmental, health and/or consumer safety benefits. If existing, please refer to relevant studies on negative impacts caused by substitution.

Legal background information for stakeholders:

According to Article 5 (1) (b) RoHS Directive, exemptions can only be granted or continued if at least one of the following conditions applies:

- Substitution of concerned hazardous substances via materials and components not containing these is technically or scientifically either practicable or impracticable.

- Elimination or substitution of concerned hazardous substances via design changes is technically or scientifically either practicable or impracticable.
- The negative environmental, health and/or consumer safety impacts caused by substitution are likely to outweigh the environmental, health and/or consumer safety benefits thereof.

References

- Coherent 2006 Stakeholder document submitted by Coherent within the online stakeholder consultation on Adaptation to scientific and technical progress under Directive 2002/95/EC for the purpose of a possible amendment of the annex,
http://circa.europa.eu/Public/irc/env/dir_2002_95/library?l=/requests_exemptions/electrical_transducers&vm=detailed&sb=Title.
- Gensch et al. 2006: Gensch, C.; Zangl, S.; Möller, M.; Lohse, J.; Müller, J.; Schischke, K.; Deubzer, O. Adaptation to Scientific and Technical Progress under Directive 2002/95/EC, Final Report, Freiburg, July 2006, page 137 ff;
http://ec.europa.eu/environment/waste/weee/pdf/rohs_report.pdf.