

Questionnaire Exemption Request No. 1

“Hexavalent chromium in alkali dispensers for in-situ production of photocathodes”

Background

The Öko-Institut together with Fraunhofer IZM has been appointed within a framework contract for the evaluation of applications for granting, renewing or revoking an exemption to be included in or deleted from Annexes III and IV of the new RoHS Directive 2011/65/EU (RoHS 2) by the European Commission.

COCIR, the European Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry has applied for an exemption for “Hexavalent chromium in alkali dispensers for in-situ production of photocathodes”.

The applicant puts forward the following main arguments:

1. According to the applicant there are no existing alternative substances or designs at present that may provide the characteristics for this specific application and that have proved reliability in terms of proper function.
2. The applicant further details that the market is shifting from the use of low end image intensifier systems, in which alkali dispensers are used in-situ, resulting in remnants of hexavalent chromium within the finished product, towards digital detectors that do not require the use of alkali dispensers. The market for low end image intensifiers is expected to decrease in such a manner that by 2020, the sole use of image intensifier unit production is assumed to be for the provision of spare parts for systems placed on the market prior to this time. As substitution development is assumed to require a period of 5-8 years before products may be vended, it may be assumed that by this time, the market for new units shall be negligible, deeming the undertaken effort as redundant.

A different exemption, which might be related to the request for exemption at hand, was requested by COCIR for the same product group in the previous consultation round and is still in proceeding: Exemption 3: Cadmium in phosphor coatings in image intensifiers for X-ray images. For further details please see [exemption 3 proceedings](#).

For details, please check the applicant's exemption request at <http://rohs.exemptions.oeko.info/index.php?id=130>.

This exemption request has been subject to a first completeness and plausibility check. The applicant has been requested to answer additional questions and to provide additional information (c.f. link above).

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

Questions

1. Please state whether you either support the applicant's request or whether you would like to provide argumentation against the applicant's request. In both cases please provide detailed technical argumentation / evidence to support your statement.
2. The applicant provided in his request for exemption an analysis of possible alternatives, for each discussing the material or application specific properties. Is there any supporting / contradicting evidence that you can provide?
3. In the possible substitute for CRVI alkali dispensers that is already on the market (produced by Alvatec), one of the cited problems is linked with the use of Indium in the seal. The Indium has a lower melting point than the heating temperature in which the degassing process is conducted. This results in its melting during the process and thus in the opening of the seal. Once the seal is broken, some of the content of the dispenser is lost, resulting in loose particles inside the image intensifier that can later cause unacceptable random appearance of the particles in X-ray images. Against this background, is there any supporting/contradicting evidence demonstrating that limitations to this process prevail, which negate the possibility of conducting the process at a lower temperature to avoid Indium melting and seal breakage or which do not enable substitution of the Indium with a material of a higher melting point that will solve the seal breakage problem?
4. In reference to the previous question, as CRVI dispensers do not use a seal mechanism at all for avoiding early loss of content, could the design of the Alvatec dispensers be altered so as to omit the Indium seal from the product and thus resolve the problem?
5. In the Alvatec product, high electric currents are used to heat the dispenser. According to the applicant, the electric current heats the electrical wires, which can lead to cracks and leaks in the glass tube. Against this background, is there any supporting/contradicting evidence demonstrating that high temperatures could be avoided using wires with other diameters?

6. The applicant mentions that SAES is developing a dispenser based on dichromate salts. Can any data and information on the applicability of this dispenser type for in-situ production of photocathodes be provided? What kind of substances are in use of this product?
7. Digital detection systems are slowly substituting the image intensifying systems where reliability and radiation dosages allow. However, at present, digital detection systems also contain heavy metals such as Cd, Pb or Hg. Could information be made available concerning the types of these systems, the application in which they are used and the amounts of RoHS substances that they apply, so that the comparison between digital detection systems and image intensifiers becomes clear?
8. In section 4.2 of the applicant request, it is mentioned that “most current Image Intensifier designs use internal alkali dispensers although it is possible to connect an external alkali dispenser to the Image Intensifier or to the Photomultiplier Tube and then to remove the dispenser after fabrication [...]”. This implies that production of CrVI-free photocathodes is at least partly established on an industrial scale. Is any further information on this production type available?
9. Against the background that the applicant states that there are no viable substitutes – is there any supporting / contradicting evidence that you can provide? Please provide sound data/evidence on why substitution/elimination is either practicable or impracticable (e.g. what research has been done, what was the outcome, is there a timeline for possible substitutes, why is the substance and its function in the application indispensable or not, etc.).
10. Are there any other arguments being relevant in the context of the evaluation of this request for exemption which are not raised in the questions above and that are of importance?

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