

1st Stakeholder Consultation – Questionnaire for indium phosphide (CAS 22398-80-7; EC 244-959-5)

Abbreviations and Definitions

EEE Electrical and Electronic Equipment

Background

The Oeko-Institut and Fraunhofer IZM have been appointed by the European Commission, within a framework contract¹, among others to support the review of the list of restricted substances and to assess seven substances with a view to their possible future restriction under Directive 2011/65/EU (RoHS 2).

Indium phosphide was specified in the project terms of reference for a detailed assessment. Initial substance information for **indium phosphide** is compiled and available on the substance specific webpage of the stakeholder consultation (<http://rohs.exemptions.oeko.info/index.php?id=292>).

The questions below outline the need for information.

Questions

1. Applications in which indium phosphide is in use

- a. Please provide information concerning products and applications in which the substance is in use.
 - i. In your answer please specify if the applications specified are relevant to EEE products and applications or not.
 - ii. Please elaborate if substitution of the substance is already underway in some of these applications, in relation to the properties for which indium phosphide is used (for example semiconductor and photovoltaic properties) and/or in relation to specific applications in which it is used (for example critical communication components),
 - iii. Where relevant, please elaborate which chemical (on the substance level) or which technology (elimination of the need to use InP) alternatives may be relevant for this purpose.
- b. Please specify if you are aware, if aside from actual use of the substance, it may be re-introduced in to the material cycle through the use of secondary materials.
 - i. Please detail in this case what secondary materials may contain indium phosphide impurities and at what concentrations as well as in the production of what components/products such materials are used.

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.

- ii. If possible please provide detail as to the changing trends of indium phosphide concentrations in such secondary materials as well as the changing trend of use of the respective secondary material in EEE manufacture.
- c. Please specify in which applications indium phosphide is used as a material constituent, as an additive or as an intermediate and what concentration of indium phosphide remains in the final product in each of these cases (on the homogenous material level).

2. Quantities and ranges in which indium phosphide is in use

- a. Please detail in what applications your company/sector applies indium phosphide and give detail as to the annual amounts of use. If an exact volume cannot be specified, please provide a range of use (for example – 10-100 tonnes per annum).
- b. Please provide information as to the ranges of quantities in which you estimate that the substance is applied in general and in the EEE sector in the EU and globally.
- c. If substitution has begun or is expected to begin shortly, please estimate how the trend of use is expected to change over the coming years.

3. Potential emissions in the waste stream

- a. Please provide information on how EEE applications containing indium phosphide are managed in the waste phase (with which waste is such EEE collected and what treatment routes are applied)?
- b. Please detail potentials for emissions in the relevant treatment processes.

4. Substitution

- a. Please provide details as to the substitution of indium phosphide:
 - i. For which applications is substitution scientifically or technically not practicable or reliable and why.
 - ii. For which applications is substitution underway? Please specify in this respect which alternatives are available on the substance level (substitution) and which are available on the technological level (elimination). For example, which alternatives can be applied instead of indium phosphide used in solar cells and in semiconductor applications (e.g. gallium arsenide)
 - iii. What constraints exist to the implementation of the named substitutes in a specific application area (provide details on costs, reliability, availability, roadmap for substitution, etc.).

5. Socio economic impact of a possible restriction

Please provide information as to the socio-economic impacts if indium phosphide is to be restricted under RoHS. Please specify your answers in relation to specific applications in which the substances are used and/or in relation to the phase-in of specific alternatives in related application areas. Please refer in your answer to possible costs

and benefits of various sectors, users, the environment, etc. where possible; please support statements with quantified estimations.

6. Further information and comments

The information compiled on this substance for the stakeholder consultation has been prepared as a summary of the publicly available information reviewed so far. If relevant, please provide further information in this regard, that you believe to have additional relevance for this review, as well as references where relevant to support your statements.

In case parts of your contribution are confidential, please clearly mark relevant text excerpts or provide your contribution in two versions (public /confidential).

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