

1st Stakeholder Consultation – Questionnaire for tetrabromobisphenol A – TBBP-A (CAS 79-94-7)

Abbreviations

EEE	Electrical and Electronic Equipment
DOPO	9,10-Dihydro-9-oxa-10-phosphaphenanthrene-10-oxide
TBBP-A	Tetrabromobisphenol A

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).

Tetrabromobisphenol A (TBBP-A) was specified in the project terms of reference for a detailed assessment. Initial substance information for TBBP-A is compiled and available on the substance specific webpage of the stakeholder consultation (<http://rohs.exemptions.oeko.info/index.php?id=291>). Against this background the questions below are intended to outline the need for additional information.

Questions

1. Applications and quantities (ranges) in which TBBP-A is in use

- a. Please provide information concerning products and applications in which the substance is in use and give detail as to the annual amounts of use.

Application	Production volume in tonnes per annum	Imported Tonnes in partly finished products (e.g. masterbatch, epoxy resins) <u>and</u> in finished products and components	Typical concentrations of TBBP-A that are applied
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Epoxy resins in printed circuit boards (reactive component)

Epoxy resins to encapsulate certain electronic components

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.

(reactive component)²

polycarbonate and unsaturated polyester resins (reactive component)

ABS³ (additive flame retardant)

Others

- 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.
- c. Please specify if you are aware, if aside from actual use of the substance, it may be reintroduced in to the material cycle through the use of secondary materials.
 - i. Please detail in this case what secondary materials may contain antimony trioxide impurities and at what concentrations as well as in the production of what components/products such materials are used.
 - ii. If possible please provide detail as to the changing trends of TBBP-A concentrations in such secondary materials (products) as well as the changing trend of use of the respective secondary material in EEE manufacture.
- d. Please specify if TBBP-A is used as an intermediate in certain application and detail in which.
- e. In which countries (worldwide) is TBBP-A currently being applied in EEE manufacture (respectively in components supplied by the supply chain) and win what quantities?

2. Production and regulation of TBBP-A

- a. TBBP-A is not produced in the EU. Globally TBBP-A is produced in China, USA, Japan, Jordan and Israel. Please estimate current amounts and the expected trend over the coming years.
- b. Please specify if you are aware of voluntary initiatives to phase out TBBP-A, for example of certain OEMs or in certain EEE sectors.

² Plastic/paper capacitors, microprocessors: used in plastic/paper capacitors, microprocessors, bipolar power transistors, IGBT (Integrated Gate Bipolar Transistor) power modules, ASICs (Application Specific Integrated Circuits) and metal oxide varistors)

³ ABS is widely used for the inner housings of refrigerators.

3. Potential emissions in the lifetime (use phase) of products and waste stream

- a. For specific products and components in which TBBP-A is present, please detail potentials for emissions in the use phase.
- b. Please provide information on how EEE applications containing TBBP-A are managed in the waste phase (with which waste is such EEE collected and what treatment routes are applied).
 - i. Please refer in your answer to the treatment of specific products and components in which TBBP-A is present, for example, how does the presence of TBBP-A in printed circuit boards affects the recyclability of resources contained in these components?
 - ii. Please detail potentials for emissions in the relevant treatment and disposal processes.

4. Substitution

- a. 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, what other flame retardants can be used instead of TBBP-A in epoxy resins used in printed circuit board applications and what other resins could be applied to eliminate the need for TBBP-A?
 - i. For which applications is substitution scientifically or technically not practicable or reliable and why.
 - ii. 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.).
 - iii. 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.
 - iv. Which chemical (e.g. DOPO) or technological alternatives may be relevant for this purpose? Please give an overview of the present market shares of alternatives in relation to the respective applications.

5. Socio economic impact of a possible restriction

Please provide information as to the socio-economic impacts if TBBP-A is 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.