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Subcommittee on Electronic Components Environment
ESG Committee of Electronic Components Board
Japan Electronics and Information Technology Industries Association (JEITA)

Guideline on the Calculation of the Concentration of RoHS Restricted Substances not being Part of the originally designed and manufactured Article

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This document aims to assist users in complying with their obligations under the EU RoHS Directive.

However, users are reminded that the text of the EU RoHS Directive is the only authentic legal reference and that the information in this document does not constitute legal advice.

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As of 3/27/2019, the following 10 substances are designated as restricted substances in the EU RoHS Directive (2011/65/EU).

- Lead
- Mercury
- Cadmium
- Hexavalent chromium
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ethers (PBDE)
- Bis (2-ethylhexyl) phthalate (DEHP)
- Butyl benzyl phthalate (BBP)
- Dibutyl phthalate (DBP)
- Diisobutyl phthalate (DIBP)

This guideline describes the calculation of the concentration of restricted substances in homogeneous material in situations where these substances were not part of the originally designed and manufactured article, but became present in the product later from external sources by adhesion, diffusion or similar processes, e.g. from packing material, storage atmosphere, adjacent components, etc.

1. Need of Criteria for the Calculation of Concentration of RoHS Restricted Substances

The RoHS Directive establishes the duty to ascertain that according with Article 4.1, EEE (electrical and electronic equipment) placed on the market does not contain the restricted substances listed in Annex II above the maximum allowable concentrations.

The Electronic Component Industry agrees and cooperates with the goal of the RoHS Directive “to contribute to the protection of human health and the environmentally sound recovery and disposal of waste electrical and electronic equipment (EEE)”.

However, in case when restricted substances are present after undergoing a process where they become adhered to or diffuse into the equipment from the external sources, it is important to specify the homogeneous material that becomes basis for calculation of the concentration.

For such cases, it is necessary to stipulate judgment criteria.

2. Basis for the Calculation of the Concentration of RoHS Restricted Substances not being Part of the originally designed and manufactured Article

The scope required for the prevention of restricted substances inclusion, pursuant to Article 4.1 of the RoHS Directive is established as “EEE placed on the market”; here EEE (electrical and electronic equipment) is defined in Article 3 (1) of the RoHS Directive as “‘EEE’ means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields and designed for use with a voltage rating not exceeding 1 000 volts for alternating current and 1 500 volts for direct current”.

It follows from this that homogeneous materials designed for use as a part of electrical and electronic equipment and their components should also be used as the basis for the calculation of concentration of restricted substances, not designed for use, but present in electrical and electronic equipment or their components.

3. Method for Calculation of the Concentration of RoHS Restricted Substances that Become Adhered to or Diffuse into Electrical and Electronic Equipment and their Components

The Electronic Component Industry recommends that for cases when restricted substances become adhered to or diffuse into electrical and electronic equipment and their components after its manufacturing, the mass of the homogeneous material that was originally designed for use as part of such equipment or their components, and to which the substances become adhered to or diffuse into, shall be used as basis (denominator) for the calculation of the concentration of the restricted substances.

That is, in the article shown in the schematic diagram below, homogeneous materials [A], [B] and [C] designed for use as a part of electrical and electronic equipment or its components is used as the basis of calculation of the concentration of the restricted substances. Therefore, we should calculate the concentration of restricted substances in homogeneous material [C], including the restricted substance "x" that is not designed for use, but present by adhesion to or diffusion into the article.

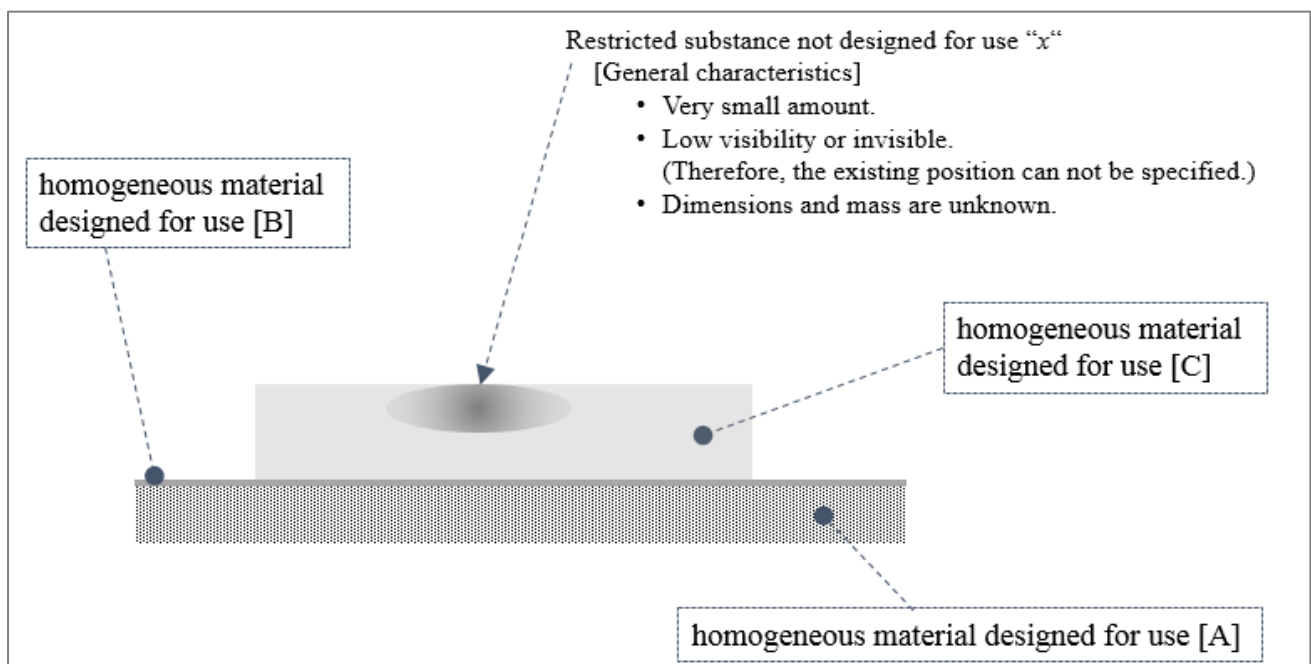


Fig. RoHS Restricted Substance "x" that becomes adhered to or diffuses into the articles

This calculation method is in accordance with:

IEC 63000:2016, Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

(This document is based on European harmonized Standard EN 50581:2012)

IEC 62321 (all parts), Determination of certain substances in electrotechnical products

IEC 62474:2018, Material declaration for products of and for the electrotechnical industry