Consultation Questionnaire Exemption Request 2021-1

Exemption Request for "Mercury in melt pressure transducers for capillary rheometers at temperatures over 300°C and pressures over 1000 bar"

Abbreviations and Definitions

EEE	Electrical and Electronic Equipment
Netzsch	Netzsch Gerätebau GmbH
Hg	Mercury
RoHS	Directive 2011/65/EU on the Restriction of Hazardous Substances in Electrical and Electronic Equipment

Background

The Oeko-Institut has been appointed by the European Commission, within a framework contract[1], for the evaluation of applications for exemption from Directive 2011/65/EU (RoHS), to be listed in Annexes III and IV of the Directive.

Netzsch Gerätebau GmbH has submitted a request for the above-mentioned exemption, which has been subject to an initial evaluation. A summary of the main argumentation for justifying the request is provided below. The applicant has been requested to answer additional questions and to provide additional information, available on the request webpage of the stakeholder consultation (http://rohs.exemptions.oeko.info/index.php?id=371).

For further details, please check the applicant's exemption request under the above link.

The objective of this consultation and the review process is to collect and to evaluate information and evidence according to the criteria listed in Art. 5 (1) (a) of Directive 2011/65/EU (RoHS 2), which can be found under:

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32011L0065:EN:NOT

If you would like to contribute to the stakeholder consultation, please read the summary of the argumentation provided and answer the questions that follow.

[1] The contract is implemented through Framework Contract No. ENV.B.3/FRA/2019/0017, led by Ramboll Deutschland GmbH.

1. Summary of argumentation of applicant on the justification of the exemption

1.1. Background

The applicant seeks to use pure mercury in a melt pressure transducer in capillary rheometers as a medium to transmit pressure in extreme conditions of up to 440°C and 2000bar. The capillary rheometer analyses the viscosity e.g. of melted polymers to predict its behavior e.g. for an extrusion process. In extruders, mercury filled melt pressure transducers are already used; as melt pressure transducers are "*large-scale stationary industrial tools*"[2], they are not in scope of the RoHS Directive.

In lower pressure ranges (up to 1000bar), mercury is substituted by sodium potassium (NaK). If these instruments are used also at high pressure, the front membrane will be damaged due to the compressibility of NaK.

Another substitute is made of an alloy, consisting of gallium, indium and tin (Galinstan). However, this tends to react with the capillary material above 300°C.

The applicant estimates from his conversation with the supplier of the transducer, that there is no "*foreseeable date*", when and if mercury can be substituted. Key problem is the compressibility of a liquid filling material as mercury has the lowest compressibility of known liquids in the given temperature and pressure range.

The applicant requests an exemption for the duration of 7 years.

1.1.1. Volume of mercury to be placed on the EU market through the exemption

The exact number of the amount of mercury put on the EU market through the exemption is confidential as it is based on sales data and market estimates. It can be assumed that this number is approximately less than 50 g/year.

1.2. Technical description

"*The lower the compressibility is, the better it is in terms of maximum pressure range and temperature drift of the sensor. So far, Mercury has the best compressibility, NaK is higher and oil is higher than NaK. Galinstan should be intermediate between Hg and NaK. Not one of the alternatives can meet the requirements of the application range*."

1.3. Applicant's justification for the requested exemption

1.3.1. **Availability of alternatives** *(Substitution or Elimination, roadmap to substitution, reliability of substitutes)*

The applicant argues that there is no alternative to mercury for this specific use case. Also, the applicant expects no such development, as "*the market for this exemption is not big enough to sustain extensive research on filling media.*"

[2] RoHS Article 4 c). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02011L0065-20211101

1.3.2. Environmental and health arguments *(also LCA aspects)*

“We have an agreement with our melt pressure transducer supplier, that they will take back all melt pressure transducers. As they receive different melt pressure transducers from different industries, they have a recycle system in place.”

1.3.3. Socioeconomic impacts

The applicant did not raise any socioeconomic impacts in its exemption request.

2. Questions for stakeholders

1. The applicant has requested an exemption, proposing the following wording formulation:
   “Mercury in melt pressure transducers for capillary rheometers at temperatures over 300°C and pressures over 1000 bar"

   a. Do you agree with the scope of the exemption (so here pressure and temperature range) as proposed by the applicant?

   b. Please suggest an alternative wording and explain your proposal if you do not agree with the proposed exemption wording.

   c. Please explain why you either support the applicant’s request or object to it. To support your views, please provide detailed technical argumentation / evidence in line with the criteria in Art. 5(1)(a) to support your statement.

2. Please provide information concerning possible substitutes or developments that may enable reduction, substitution or elimination, at present or in the future, of “Mercury in melt pressure transducers for capillary rheometers at temperatures over 300°C and pressures over 1000 bar”;

   a. In this regard, please provide information as to alternatives that may cover part or all of the applicability pressure and temperature range;

   b. Please provide quantitative data as to application specifications to support your view.

3. Please provide information as to research initiatives which are currently looking into the development of possible alternatives for some or all of the application range of *“Mercury in melt pressure transducers for capillary rheometers at temperatures over 300°C and pressures over 1000 bar”*.

   a. Please explain what part of the application range is of relevance for such initiatives (in what applications substitution may be possible in the future).

   b. Please provide a roadmap of such on-going research (phases that are to be carried out), detailing the current status as well as the estimated time needed for further stages.

4. As part of the evaluation, socio-economic impacts shall also be compiled and evaluated. For this purpose, please provide details in respect of the following:

a. Please estimate possible amounts of waste to be generated through a forced substitution should the exemption not be granted. In this respect, please clarify whether devices placed on the market before the 22 July 2021 could still be serviced through the spare parts provision stipulated in the Directive under Article 4.

b. Please estimate possible impacts on employment in total, in the EU and outside the EU, should the exemption not be granted. Please detail the main sectors in which possible impacts are expected – manufacture, supply chain, retail, etc.

c. Please estimate additional costs associated with a forced substitution should the exemption not be granted, and how this is divided between various sectors (e.g. private, public, industry: manufacturers, suppliers, retailers, end-users).

5. Please provide any further information and/or data that you think is of importance to substantiate your views.

In case parts of your contribution are confidential, please provide your contribution in two versions (public /confidential). Please also note, however, that requested exemptions cannot be granted based on confidential information!

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.

If the contribution contains personal data please agree that it can be published. Please provide your consent e.g. in the email ("Yes, you can publish my identity/personal data").