Consultation Questionnaire Exemptions 8(b) and 8(b)-I of RoHS Annex III

Current wording of the exemptions:

8(b) Cadmium and its compounds in electrical contacts

8(b)-I Cadmium and its compounds in electrical contacts used in:

* Circuit breakers,
* Thermal sensing controls,
* Thermal motor protectors (excluding hermetic thermal motor protectors)
* AC switches rated at:

6 A and more at 250 V AC and more, or

12 A and more at 125 V AC and more,

* DC switches rated at 20 A and more at 18 V DC and more, and
* Switches for use at voltage supply frequency ≥ 200 Hz

# Acronyms and definitons

AgCdO silver cadmium oxide

# INTRODUCTION

## Background

Bio Innovation Service, UNITAR and Fraunhofer IZM have been appointed[[1]](#footnote-2) by the European Commission through for the evaluation of applications for the review of requests for new exemptions and the renewal of exemptions currently listed in Annexes III and IV of the RoHS Directive 2011/65/EU.

Sensata et al. submitted a request[[2]](#footnote-3) for the renewal of the above-mentioned exemption. The request has been subject to a first completeness and plausibility check. The applicant has been re-quested to answer additional questions and to provide additional information, available on the request webpage of the stakeholder consultation.[[3]](#footnote-4)

## Summary of the Exemption Request

Cadmium is used in switching electrical contact systems in the form of silver cadmium oxide (AgCdO), which is one of many categories of metal alloys commercially available for use in switching electrical contacts. Electrical arcs occurring at the opening and closing of the contacts alter the surface layer of the contacts during cycling, which affects the contact system properties and consequently its performance. Surface damage resulting from arcing can lead to contact failure, compromising the reliability of the equipment and creating potential safety hazards for humans, animals and property. As explained further within this dossier, AgCdO remains far superior to most alternatives at “quenching” electrical arcs - switching off electrical current quickly and cleanly and avoiding contact welding and premature failure.

Where suitable cadmium-free alternatives have been found to provide required cycle reliability and product performance/safety, the contact system is converted to a cadmium-free alternative (the following examples are provided by Marquardt and Sensata Technologies in 4(A)5 last paragraph). The suitability of alternative materials is affected by a range of factors such as, but not limited to, voltage, current range, size, opening and closing speed, contact force, frequency and required number of operating cycles and other complex conditions in the application; such as continuously changing electromagnetic fields in electric motors.

This multiplicity of factors leads to a substantial amount of “trial-and-error” by manufacturers, their customers and suppliers during product development. It also makes it highly impractical to specify, with any precision, the conditions under which alternative formulations offered by material suppliers are suitable for specific applications. Differing formulations within each major category of metal alloys result in literally hundreds of possible choices.

In addition to switching electrical contacts, cadmium is also being used in fixed3 electrical contacts under special conditions for category 8 and 9 applications. Use of cadmium in fixed contacts is needed in highly sensitive applications, such as oxygen and capnography sensors. These applications require very low “drift” during continuous operating periods spanning many years, along with the ability to withstand electro-migration whilst providing suitable conductivity and adhesion properties.

In line with the current state of the business to replace cadmium in electrical contacts by reliable and safe alternatives, Sensate et al. apply for an extension of the exemptions for the maximum validity periods, based on a partly narrowed scope as proposed by this application.

The stakeholder consultation is part of the review process for the request at hand. 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.[[4]](#footnote-5)

To contribute to this stakeholder consultation, please answer the below questions until the 27th of May 2021.

# Questions

1. Sensata et al. requested the renewal2 of exemption 8(b) in its current wording. They propose a new wording for exemption 8(b)-I as listed in the below table. Sensata et al. request the maximum validity period of 7 years for cat. 8 and 9 and 5 years for cat. 1-7 and 10:

|  |  |
| --- | --- |
| **Current Wording for 8(b)-I** | **Proposed new wording for 8(b)-I:** |
| Cadmium and its compounds in electrical contacts used in:   * + circuit breakers, | Cadmium and its compounds in electrical contacts used in:   * + circuit breakers rated at   1. 10 A and more at 250 V AC and more, or   2. 15 A and more at 125 V AC and more, |
| * + thermal sensing controls, | * + thermal sensing controls rated at   10 A and more at 250 V AC and more, or  15 A and more at 125 V AC and more, |
| * + thermal motor protectors (excluding hermetic thermal motor protectors) | * + thermal motor protectors (excluding hermetic thermal motor protectors) |
| * + AC switches rated at:   6 A and more at 250 V AC and more, or  12 A and more at 125 V AC and more, | * + AC switches rated at:   10 A and more at 250 V AC and more, or  15 A and more at 125 V AC and more, |
| * + DC switches rated at 20 A and more at 18 V DC and more, and | * + DC switches rated at 25 A and more at 18 V DC and more, and |
| * + Switches for use at voltage supply frequency ≥ 200 Hz. | * + Switches rated at 300 V and more for use at voltage supply frequency ≥ 200 Hz |

* 1. Please let us know whether you support or disagree with the wording, scope and re-quested duration of the exemption. To support your views, please provide detailed technical argumentation / evidence in line with the criteria4 in Art. 5(1)(a).
  2. If applicable, please suggest an alternative wording and duration and explain your proposal.
  3. Do you see the proposed new exemption to include relevant shares of cadmium contacts into the scope? Could you please also let us know typical uses of cadmium contacts outside the scope of the proposed new wording in EEE in the scope of the RoHS Directive?
  4. Do you know any applications in EEE of category 11 that would be in the scope of new exemption 8(b)-I?

1. Please provide information concerning possible substitutes or elimination possibilities at present or in the future so that the requested exemption could be restricted or revoked.
   1. Please explain substitution and elimination possibilities and for which part of the ap-plications in the scope of the requested exemption they are relevant.
   2. Please provide information as to research to find alternatives that do not rely on the exemption under review (substitution or elimination), and which may cover part or all of the applications in the scope of the exemption request.
   3. Please provide a roadmap of such on-going substitution/elimination and research (phases that are to be carried out), detailing the current status as well as the estimated time needed for further stages.
2. Do you know of other manufacturers producing devices of comparable features and performance like the ones in the scope of this exemption request that do not depend on RoHS-restricted substances, or use smaller amounts of these substances compared to the applications in the scope of this exemption?
3. As part of the evaluation, socio-economic impacts shall also be compiled and evaluated. For this purpose, if you have information on socioeconomic aspects, please provide details in respect of the following:
   1. What are the volumes of EEE in the scope of the requested exemptions which are placed on the market per year?
   2. What are the volumes of additional waste to be generated should the requested ex-emption not be renewed or not be renewed for the requested duration?
   3. What are estimated impacts on employment in total, in the EU and outside the EU, should the requested exemption not be renewed or be renewed for less than the re-quested time period? Please detail the main sectors in which possible impacts are expected – manufacturers of equipment in the scope of the exemption, suppliers, re-tail, users of MRI devices, etc.
   4. Please estimate additional costs associated should the requested exemption not be renewed, and how this is divided between various sectors (e.g. private, public, industry: manufacturers, suppliers, retailers).
4. Any additional information which you would like to provide?

**Please note that answers to these questions can be published in the stakeholder consultation, which is part of the evaluation of this request. If your answers contain confidential information, please provide a version that can be made public along with a confidential version, in which proprietary information is clearly marked.**

**Please do not forget to provide your contact details (Name, Organisation, e-mail and phone number) so that the project team can contact you in case there are questions concerning your contribution.**

**It would be help the review process if you could kindly provide the information in formats that allow copying text, figures and tables to be included into the review report where applicable.**

1. It is implemented through the specific contract 070201/2020/832829/ENV.B.3 under the Framework contract ENV.B.3/FRA/2019/0017 [↑](#footnote-ref-2)
2. Exemption request available at <http://www.rohs.biois.eu/8(b)_8(b)-I_Exemption%20Request_31Jan2020_final.pdf> [↑](#footnote-ref-3)
3. Clarification questionnaire available at <http://www.rohs.biois.eu/Ex_8-III_Sensataetal_Questionnaire-1_Clarification.pdf> [↑](#footnote-ref-4)
4. Directive 2011/65/EU (RoHS) available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32011L0065:EN:NOT> [↑](#footnote-ref-5)