

Questionnaire 1 (Clarification) for Exemption III-7(a) (TMC)

Table 1: Currently valid exemption wording and scope

No.	Exemption	Scope and dates of applicability
III-7(a)	Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead)	<p>Applies to categories 1-11 (except applications covered by point 24 of this Annex) and expires on</p> <ul style="list-style-type: none"> - 21 July 2021 for categories 1-7 and 10, and for category 8 other than in vitro diagnostic medical devices and cat. 9 other than industrial monitoring and control instruments - 21 July 2023 for category 8 in vitro diagnostic medical devices; - 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11

Acronyms and Definitions

Cat. Category, referring to the categories of EEE specified in Annex II of the current RoHS Directive

COM European Commission

EEE Electrical and electronic equipment

1. Background

Bio Innovation Service, UNITAR and Fraunhofer IZM have been appointed¹ 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.

TMC submitted a request the renewal of the above exemption for cat. 9 industrial monitoring and control instruments (IMCI) with the wording, scope and validity period shown in the below table:

Table 2: Requested exemption renewal

No.	Requested exemption	Requested scope and dates of applicability
III-7(a)	Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more of lead)	<p>Applies to category 9 industrial monitoring and control instruments.</p> <p>Expires on 21 July 2031 (= 2024 + 7 years)</p>

¹ Implemented through the specific contract 070201/2020/832829/ENV.B.3 under the Framework contract ENV.B.3/FRA/2019/0017

As result of a first review we identified that some information is missing. Against this background the questions below are intended to clarify some aspects concerning the request at hand.

We ask you to kindly answer the below questions until 14 September 2023 latest.

2. Questions

1. Could you please confirm that Table 2 correctly reflects the requested renewal of the exemption?

TMC reply to question 1:

TMC would like to reiterate that all submitted renewal applications, including the renewal application RoHS exemption III-7(a), request the renewal of the exemption for category 9 industrial monitoring and control instruments in its existing wording with the subsequent maximum renewal period of 7 years.

No.	Requested exemption	Requested scope and dates of applicability
III-7(a)	Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more of lead)	Applies to category 9 industrial monitoring and control instruments expires on 21 July 2031 (= 2024 + 7 years)

2. Exemption 7(a) was reviewed by Baron et al. (2022)². They recommended specifying exemption 7(a) like listed in Table 3 below.

² C.f. Öko-Institut, https://rohs.exemptions.oeko.info/fileadmin/user_upload/RoHS_Pack_22/RoHS_Pack-22_final_report_amended_February_2022.pdf



Table 3: Renewal of current exemption 7(a) recommended by Baron et al. (2022)

Exemption formulation 7(a)	Duration
<p>Lead in high melting temperature type solders (i.e., lead-based alloys containing 85 % by weight or more lead) (<i>excludes those in the scope of exemption 24</i>)</p>	<p>For all categories except applications covered by point 24 of this Annex, expires on 21 July 2024.</p>
<p><i>Lead in high melting temperature type solders (i.e., lead-based alloys containing 85 % by weight or more lead) when used for the following applications (excludes those in the scope of exemption 24):</i></p> <p><i>I) for internal interconnections for attaching die, or other components along with a die in semiconductor assembly with steady state or transient/impulse currents of 0.1 A or greater or blocking voltages beyond 10 V, or die edge sizes larger than 0.3 mm x 0.3 mm</i></p> <p><i>II) for integral (meaning internal and external) connections of die attach in electrical and electronic components, if the thermal conductivity of the cured/sintered die-attach material is $>35W/(m*K)$ AND the electrical conductivity of the cured/sintered die-attach material shall be $>4.7MS/m$ AND solidus melting temperature has to be above 260°C</i></p> <p><i>III) In first level solder joints (internal or integral connections - meaning internal and external) for manufacturing components so that subsequent mounting of electronic components onto subassemblies (i.e., modules or sub-circuit boards or substrates or point to point soldering) with a secondary solder does not reflow the first level solder. This item excludes die attach applications and hermetic sealings</i></p> <p><i>IV) In second level solder joints for the attachment of components to printed circuit board or lead frames:</i></p>	<p>Applies to all categories except applications covered by point 24 of this Annex, expires on 21 July 2026.</p>
<p><i>1. in solder balls for the attachment of ceramic ball-grid-array (BGA)</i></p> <p><i>2. in high temperature plastic overmouldings ($> 220\text{ }^{\circ}\text{C}$)</i></p> <p><i>V) as a hermetic sealing material between:</i></p> <p><i>1. a ceramic package or plug and a metal case,</i></p> <p><i>2. component terminations and an internal sub-part</i></p> <p><i>VI) for establishing electrical connections between lamp components in incandescent reflector lamps for infrared heating or high intensity discharge lamps or oven lamps</i></p> <p><i>VII) for audio transducers where the peak operating temperature exceeds 200°C</i></p>	

Source: Baron et al. (2022)

The European Commission (COM) have not yet officially published their decision as to the adoption of the above recommendation. The COM wish the consultants to assess in this current review round whether there are any substantial reasons in line with Art. 5(1)(a) against the adoption of the above recommendation for EEE of categories 8, 9 and 11.

If the review shows that TMC's arguments justify the renewal of the exemption, the consultants would recommend the below wordings, scopes and expiry dates. These expiry dates may be adapted to the specific situation of cat. 9 IMCI in the scope of TMC's renewal request. Table 4 reflects the resulting wordings, scopes and validity periods in consistency with the state of science and technology assessed by Baron et al. (2022) and with their recommendations.

Table 4: Renewal of current exemption 7(a) like recommended by Baron et al. (2022) (modified)

No. 3	Recommended Exemption	Recommended scope and dates of applicability
III-7(a)	Lead in high melting temperature type solders (i.e., lead-based alloys containing 85 % by weight or more lead)	Applies to all categories but excluding applications covered by exemption 24 of this Annex. Expires on 21 July 2024 for all categories
III-7(d)	<p>Lead in high melting temperature type solders (i.e., lead-based alloys containing 85 % by weight or more lead) when used for the following applications, excluding those in the scope of exemption 24:</p> <p>I) For internal interconnections for attaching die, or other components along with a die in semiconductor assembly with steady state or transient/impulse currents of 0.1 A or greater or blocking voltages beyond 10 V, or die edge sizes larger than 0.3 mm x 0.3 mm</p> <p>II) For integral (meaning internal and external) connections of die attach in electrical and electronic components, if the thermal conductivity of the cured/sintered die-attach material is >35 W/(m*K) AND the electrical conductivity of the cured/sintered die-attach material shall be >4.7 MS/m AND solidus melting temperature has to be above 260°C</p> <p>III) In first level solder joints (internal or integral connections - meaning internal and external) for manufacturing components so that subsequent mounting of electronic components onto subassemblies (i.e., modules or sub-circuit boards or substrates or point to point soldering) with a secondary solder does not reflow the first level solder. This item excludes die attach applications and hermetic sealings</p> <p>IV) In second level solder joints for the attachment of components to printed circuit boards or lead frames:</p> <p>1. In solder balls for the attachment of ceramic ball-grid-array (BGA)</p> <p>2. In high temperature plastic overmouldings (>220 °C)</p> <p>V) As a hermetic sealing material between:</p>	<p>Applies to all categories from 22 July 2024 on</p> <p>Expires on</p> <ul style="list-style-type: none"> - 21 July 2026 for categories 1 to 8, 9 other than industrial monitoring and control instruments, 10 and 11 - 21 July [2026 + X] for cat. 9 industrial monitoring and control instruments

³ The numbering is introduced in the current review to facilitate addressing the various exemption parts



3. A ceramic package or plug and a metal case, 4. A component termination and an internal sub-part
VI) For establishing electrical connections between lamp components in incandescent reflector lamps for infrared heating or high intensity discharge lamps or oven lamps
VII) For audio transducers where the peak operating temperature exceeds 200 °C

X can be maximum 5 years

Please comment on this proposal explaining clearly any obstacles you see if you do not agree to the proposal.

TMC reply to question 2:

As outlined in the exemption renewal request and the annexed socio-economic analysis submitted to the European Commission by TMC on 20 January 2023, TMC **does not** agree with the recommendation presented in table 4.

Lead is a significant ingredient of the solder alloys used to electrically or physically join two elements. High Melting Point (HMP) solders are used for a wide variety of applications. Based on the application type, a lead amount of >85% is required to achieve the necessary melting temperature and to obtain other material properties.

As further outlined in TMC's submission there is no single substitute available that would be suitable for all the applications identified and match the technical performance of lead. Currently, substitutes for even the major uses have rarely been found. Evaluating alternatives for each of the niche uses would take an enormous amount of time and resources, with little probability of success. The Test & Measurement Coalition therefore applies for the renewal of exemption 7(a) for the **maximum** renewal period.

As regards the proposed splitting of exemption III-7(a), TMC would like to emphasise the importance of *retaining the initial wording and numbering* as published in the original RoHS annexes. Amending the scope of the exemption by changing the application or substance restriction value has a significant administrative burden to industry and negatively impacts the compliance. This includes:

- The data management and ERP Solution re-engineering to segregate existing supplier declarations from those of the new (re-worded) exemption takes time as well as resources and is open to error.
- Separating and managing suppliers' declarations when schemas are in transition adds huge complexity where the same exemption number exists with a different description.

It needs to be kept in mind that industrial monitoring and control instrument manufacturers have to manage suppliers' declarations for hundreds of thousands of items. Additionally, after reviewing the current state of the evolution of technology for the cat. 9 industrial measurement and control instruments, TMC members have difficulty in understanding how the rewording and relisting and/or splits recommended by the consultants will lead to greater protection of human health and the environment compared to the wording in its current form. The recommended rewording/split would only lead to significant unnecessary burden for stakeholders without commensurate benefits.

As noted, the European Commission (COM) have not yet officially published their decision as to the adoption of the above recommendations, and so the global electronics supply chain is not able to provide any information regarding these revised exemption definition proposals. Expiring exemption 7(a) in the proposed timeline of July 2024 would necessitate a complete market withdrawal triggering the financial impacts as outlined in our SEA.

TMC therefore does not agree with the consultants' proposed wording and splitting as outlined in the above table and reiterates the renewal request as outlined in renewal application documents and the answers to question 1.

Please note that answers to these questions will be published as part of the evaluation of this exemption 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.

We ask you to kindly provide the information in formats that allow copying text, figures and tables to be included into the review report.

3. References

Baron et al. (2022): Study to assess requests for a renewal of nine (-9-) exemptions 6(a), 6(a)-I, 6(b), 6(b)-I, 6(b)-II, 6(c), 7(a), 7(c)-I and 7 (c)-II of Annex III of Directive 2011/65/EU (Pack 22) – Final Report (Amended Version). Under the Framework Contract: Assistance to the Commission on technical, socio-economic and cost-benefit assessments related to the implementation and further development of EU waste legislation. Author(s): Yifaat Baron, Carl-Otto Gensch, Andreas Köhler, Ran Liu, Clara Löw, Katja Moch, Oeko-Institut e. V. (Pack 22). retrieved from https://rohs.exemptions.oeko.info/fileadmin/user_upload/RoHS_Pack_22/RoHS_Pack-22_final_report_amended_February_2022.pdf.