

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

Current wording of exemption 7(a)

Table 1: Currently valid exemption wording

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)	Applies to categories 1 to 11 (except applications covered by point 24 of this Annex) and expires on <ul style="list-style-type: none"> - 21 July 2021 for categories 1 to 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 I 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.

EUROMOT et al. submitted a request for the renewal of the above exemption with the wording, scope and validity period shown in the below table:

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



Table 2: Requested exemption renewal

No.	Requested exemption	Requested scope and dates of applicability
III-7(a)	<i>Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more of lead) used in engines, engine components and ancillary components and in end-products in which they are used</i>	<i>Applies to category 11 and expires on 21 July 2029 (= 2024 + 5 years)</i>

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?

The proposed exemption renewal as outlined in Table 2 correctly reflects the requested renewal of the exemption.

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 $>35\text{W}/(\text{m}\cdot\text{K})$ AND the electrical conductivity of the cured/sintered die-attach material shall be $>4.7\text{MS}/\text{m}$ 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 EUROMOT's arguments justify the renewal of the exemption, the consultants would recommend the below wordings, scopes and expiry dates. The expiry dates may be adapted to the specific situation of cat. 11 in the scope of EUROMOT's renewal request. **Error! Reference source not found.** 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)	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: <ul style="list-style-type: none"> <li data-bbox="290 1263 1026 1429">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 <li data-bbox="290 1429 1026 1630">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 <li data-bbox="290 1630 1026 1854">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 <li data-bbox="290 1854 1026 1930">IV) In second level solder joints for the attachment of components to printed circuit boards or lead frames: 	Applies to all categories from 22 July 2024 on Expires on <ul style="list-style-type: none"> <li data-bbox="1043 1249 1359 1308">- 21 July 2026 for categories 1 to 10 <li data-bbox="1043 1339 1359 1397">- 21 July [2026 + X] for cat. 11

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



1. In solder balls for the attachment of ceramic ball-grid-array (BGA)
2. In high temperature plastic overmouldings (>220 °C)
V) As a hermetic sealing material between: <ol style="list-style-type: none"> 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 3 years

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

The original scope of 7(a), rather than the proposed 7(d) is required for internal combustion engines, associated components, and end-products in which these are used. The proposed scope of 7(d) is too restrictive and will likely preclude to necessary technical use of high melting point solders in applications not listed. EUROMOT members are not able to determine if all lead-high melting point solders are captured by the proposed 7(d) as they use a wide variety of electronic components utilising exemption 7(a), but electronics suppliers do not provide information as to whether this is covered by 7(d). As such, it is essential that sufficient time is required where the 7(a) scope remains valid for EUROMOT members, so the qualification lead-free alternatives is able to be undertaken. Due to the impacts to reliability and the consideration that EUROMOT member products have a lifetime of up to 20 years, 5 - 7 years (without NRMM Emissions Regulation re-approval) and 6 - 8 years (with NRMM Emissions Regulation approvals) is required to undertake the relevant testing. With the testing starting from the date a promising alternative is identified. Without the continued provision of 7(a) engine and end-product manufacturers will be forced to stop selling products that do not comply with RoHS.

At this stage, it is not known which products would be affected, but could affect many types of end-users in the EU. For example, construction and other industries may not be able to operate if essential equipment is not available. If supply of emergency generators is affected, this may affect, for example, hospitals who use these during power cuts. There would be a risk to patient's survival during operations or other medical procedures (such as MRI examinations and monitoring patients in intensive care) may not be possible if emergency generators are not available.

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.