

# Consultation Questionnaire Exemption 3 of ELV Annex II

Table 1: Current wording of exemption 3

No.	Exemption	Scope and dates of applicability
3	Copper alloys containing up to 4 % of lead by weight	This exemption shall be reviewed in 2025

## Acronyms and Definitions

Cu	copper
Mn	Manganese
Pb	Lead
Si	Silicon
Sn	Tin
Zn	Zinc

### 1. Background

Bio Innovation Service, UNITAR and Fraunhofer IZM have been appointed<sup>1</sup> by the European Commission for the evaluation of applications for new exemptions and the renewal/continuation of exemptions currently listed in Annex II of the ELV Directive 2000/53/EC.<sup>2</sup>

This questionnaire has been prepared for the stakeholder consultation held as part of the evaluation. The objective of this consultation is to collect information and evidence for subsequent review to assess whether the exemption is still justified according to the criteria listed in Art. (4)(2)(b)(ii) of Directive 2000/53/EC (ELV Directive)<sup>3</sup>.

Additional background information can be found on the exemption review page accessible through the following link: [www.elv.biois.eu](http://www.elv.biois.eu)

**We welcome your contribution to this stakeholder consultation. We recommend reading the below section before you answer the questions.**

### 2. Main Observations in the Previous Review

The above exemption was reviewed by Deubzer et al. (2021) last time under the ELV Directive, and the consultants concluded that the use of lead was avoidable for certain applications but that overall, the scope of the exemption could not be narrowed to reflect this substitution successes in the exemption wording.

<sup>1</sup> It is implemented through the specific contract 070201/2020/832829/ENV.B.3 under the Framework contract ENV.B.3/FRA/2019/0017

<sup>2</sup> ELV Directive, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0053>

<sup>3</sup> C.f. EUR-Lex, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0053>

The available information at that time suggested that the current maximum lead content of 4 % should be maintained. As to the substitution of lead, valves in variable capacity air conditioners operating with steel shafts, and two insert nuts could be demonstrated to be cases where a lead-free copper alloy (EcoBrass) successfully replaced a standard copper alloy with 3 % of lead content. For technical reasons, these substitution successes could not be reflected in the exemption scope.

Around 20 lead-free alloys were reported by applicants in 2020 to be available, including new ones just having entered the market which should have offered potential for further substitutions if application-specific and systematic tests are applied. Next to the above EcoBrass and others, the below lead-free copper alloys were explicitly classified as new and for further assessment:

- AquaNordic lead-free copper alloy that might be a substitute of leaded brass from machinability point of view.
- Novel lead-free copper alloys for oil-hydraulic applications as bushings, slippers or distributor plates, by the company Otto-Fuchs<sup>4</sup> aimed to substitute leaded-alloys with a lead-content not exceeding 0.8 % by weight.
- The Aviva Model 3 alloy offering very good machinability, high conductivity and excellent dezincification-resistance properties.
- CuSi4Zn9MnP (wrought alloy) and CuSn4Zn2PS-C (casting alloy)

In the light of the above developments, Deubzer et al. (2021) deemed appropriate a validity period which is long enough for application-centred and specific assessments of substitution possibilities or, in case, the impossibility of substitution in certain applications, so that applicants will be able to provide substantiated, sound and transparent evidence where the use of lead may still be unavoidable.

### 3. Questions

1. As to the above-mentioned alloys:

Where they tested as to where/in which applications they can substitute leaded copper alloys? If so, please let us know how they were tested generally and application-specific. Please also provide the results concerning their potential to substitute leaded copper alloys in general or in specific uses taking into account the specific properties of the respective lead-free alloys and the requirements of specific applications which they can match.

The ecobrass alloy (wieland designation eco SW1) has been sold by us for years, along with other lead-free alloys (see point 2) and is also used in the automotive sector.

2. Do you know of other promising lead-free copper alloys besides the ones mentioned above?

Our portfolio of lead-free alloys runs under the name "ecoline". These are alloys that have a maximum lead content of 0.1% and are still easy to machine. There is also a subgroup that is tailored to the requirements of the automotive sector and can replace the lead-containing brass alloys used there.

wieland	designation	Standard designation		Substitute for	
		EN designation	ASTM/ UNS-No.	EN	ASTM/ UNS-No.
eco SZ2®	CuZn36Si1P	CW726R	C68370	CW614N; CW617N	C38500
eco SZ3®	CuZn40SiP	N/A	N/A	CW614N; CW617N	C38500
eco SZ4®	CuZn42	CW510L	N/A	CW614N; CW617N	C38500
eco SZ5®	CuZn40	CW509L	C27450	CW612N	C37700
eco SD4®	CuZn37Mn3Al2Si	N/A	N/A	CW713R	C67420
eco SX1®	CuZn31Mn2SiAl	N/A	N/A	CW713R	C67420

<sup>4</sup> B. Reetz, T. Münch, Challenges for novel lead-free alloys in hydraulics, 12th International Fluid Power Conference, Dresden, 2020.





3. Are tests available that demonstrate which applications of leaded copper alloys they can replace in automotive applications?

Some of the above-mentioned alloys have only recently been introduced. eco SD4; eco SX1 and ecobrass have been used under series conditions for several years.

4. Are there any leaded copper alloys with significantly reduced lead contents that could replace other leaded alloys with high lead content?

See point 2

5. In the last review by Deubzer et al. (2021), ACEA et al. stated that 3D-printing of parts using or replacing lead-copper was not yet sufficiently mature. Have 3D-printed parts meanwhile become available that could be a reliable substitute for parts produced from leaded copper alloys?

N/A

6. Please explain the efforts your organisation has undertaken to find and implement the use of lead-free alternatives for automotive uses. Please refer to alternatives, which at least reduce the amount of lead applied or eliminate its necessity altogether.

Extensive research work has led to the development of the alloys mentioned under point 2 and will continue.

7. Please provide a roadmap specifying the past and necessary next steps/achievements in research and development including a time scale for the substitution or elimination of lead in this exemption.

For a substitution of the materials currently used, including the necessary qualification periods, we assume a total duration until 2030. For the area of combustion engines, see point 9.

8. What is the amount of lead that would be contained in vehicles
- placed on the EU market
  - worldwide

in case the exemption is continued? Please provide at least a rough calculation or sub

- a. According Cu2 Consultation – 2004-2023f “Twenty years of Brass Rods in Europe and 2024-2025 outlook Volume 1 – Summary” – Page 28 it is estimated that the brass mills fabricate some 50 000 t of brass rods for the automotive market.

b. N/A

9. Overall, please let us know whether you agree with the necessity to continue the exemption and your arguments for or against the continuation.

For sustainability reasons, we strive for a product portfolio without materials containing lead (Pb < 0,1%). We can understand the need for a differentiated exemption regulation for the combustion engine components, as there is already an end to putting these on the market in 2035 and the expense of a replacement material therefore seems disproportionate.

10. Is there any other information you would like to provide?

N/A

#### 4. Your contact details

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**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 also add “CONFIDENTIAL” to the file name to prevent any publication of confidential information..**

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

#### 5. References

Deubzer et al. (2021): 11th adaptation to scientific and technical progress of exemptions 2(c)(i), 3 and 5(b) of Annex II to Directive 2000/53/EC (ELV). Final report. in cooperation with Dr. Deubzer, Otmar, Fraunhofer IZM und UNITAR, UNITAR Christian Clemm and BioIS Shailendra Mugdal  
Deubzer et al. Dr. Deubzer, Otmar, Fraunhofer IZM und UNITAR; UNITAR Christian Clemm; BioIS Shailendra Mugdal  
<https://data.europa.eu/doi/10.2779/373311>  
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