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Sturbridge January 29, 2021

Subject: Clarification Questionnaire Exemption No. 7(c)-I

Dear evaluation team,

Before answering the questions in the Clarification Questionnaire (received per your email on December 22, 2020) in more detail we feel that we need to present some context to our application:

In our original application for exemption renewal we marked that our application was directing at both exemptions Annex III 7(C)-I as well as Annex IV-3. After filing our original application we have been contacted by the EU on this "dual use" and we, by mistake revised it in only one application (the one currently under review), where we actually should have filed also a 2nd application directed at Annex IV- 3/39.

We understand that as a result of this, our application is in some aspects ambiguous and needs further clarification:

- We agree that the MCPs product group, based on exemption history, is actually now subject to Ex. 3 and Ex. 39 of Annex IV and indeed should not be within the scope of this application.

- Both the CEM and RGP product groups however, although also mainly applied within the directive categories 8 and 9, are (in our opinion) not subject to the current Annex IV exemptions. So that why is we specifically for these two product groups apply for further extension of Annex III 7(C)-I

- The above is also why in chapter 4.3 (A) 1a – the checkboxes are marked for categories 8 and 9, where we indeed should have also checked box 11

So, our application is due to its original (dual use) intent, in some information actually out of scope. Still, we do feel that the set of information in itself is relevant and informative for your evaluation process. To be more precise related to the scope of your evaluation, we will in answering your questions, provide details for the CEM and RGP product groups specifically.

We do hope this context helps you in better understanding our application and provides some answers that you might have on it.

General:
Our application is ambiguous in the amount of lead used in all three product groups. The relevant table summarize a total of 133 Kg in worldwide delivered products, where in chapter 4.3 (A) 5 we mention 145kg. This discrepancy can be explained by the fact that the mentioned 145Kg is actually the amount of PbO (Lead-Oxyde) where the 133 Kg. is the amount of actual lead for all products

For this application the relevance is on the CEMs and RGPs : being 132 Kg of Lead of which about 25% is applied within the European union: **So 33 Kg.**

Question 1 (a):
We cannot make a segmentation in application areas or products groups related to the necessity to apply lead in our products. For all three product groups the production process starts with bringing together several similar compounds to produce resistive glass. One of the essential compounds is lead, which is still necessary to realize stable quality for the resistive properties that today are required to meet market driven specifications.
Alternative technologies (chemical compound structures not using lead) are either still under development or not yet functional to a level that they can be regarded as realistic alternatives. We will clarify further under 1(b).

Question 1 (b)
The key properties of the use of lead glass in our products are the provision of current flow, the crack resistance of the glass, and the reduced melting temperature and viscosity of the glass. Photonis and others in the industry are working to develop alternatives methods and materials to enable the replacement of the lead glass, and there are some promising alternatives, but the technology is not presently sufficiently mature to replace lead-glass. Even when these alternate technologies are mature, the conversion to lead-free products will require an extended qualification period due to the wide range of applications where the lead-glass product have historically been used.

Question 2
In the table on page 12, Under the heading of Electronic glasses (MCPS, CEMs, and RGPs), in addition to the boxes that are already checked, the "Reducing the melting temperature of the glass" and "High Mechanical strength /high crack resistance;" columns should also be checked.

Question 3:
We confirm that the use of Lead is necessary for all three product groups (MCPs, CEMs and RGPs).
For MCPs we however also confirm that these are actually subject to Ex.3 and Ex. 39 of Annex IV and not within the scope of this evaluation process.
This application is specifically for CEMs and RGPs. We are aware that the majority of applications (if not all) for both CEMs and RGPs is within category 8 and 9 of the directive but we are unaware that the current Annex IV exemptions also cover these specific product groups

Question 6:

As explained above. For this application for further exemption of Annex III 7(C)-I, it is the amount of lead in our CEM and RGP products that is (in our opinion) relevant: being 132 Kg of Lead of which about 25% is applied within the European union: **So 33 Kg.**

Question 7

In Table 1 of section 6.1.3 of our application we list capabilities and positive attributes of various detector types. For most applications, specific combinations of these capabilities are required. An example of such a combination of capabilities is listed in Annex IV referring to MCPs, which cites the compact size, large input area, and fast time response. While other detectors can be used for some of the same applications as MCPs and CEMs there not alternatives that possess all their advantages. This very wide range of capabilities is why lead-glass MCPs and CEMs have been used in such a broad range of applications, which can extend the process of establishing and verifying alternate technologies.

	MCP	CEM	Discrete Dynode Multipler	Photodiode †	Photo-Multiplier tube	Electron-bombarded CCD
High Amplification	•	•	•		•	
Single-particle sensitivity	•	•	•	•	•	
Fast response	•		•	•		
High res. Imaging	•					•
Large input areas	•				•	•
Can measure Ions	•	•	•			
Can measure electrons	•	•	•	•		•
Can measure UV light	•			•	•	•
Can measure X-rays	•	•	•	•	•	•
Low background noise	•	•	•			
Long operating life	•	•	•	•	•	•
Compact size	•	•		•		•
Radiation hardness	•	•	•		•	
High magnetic field tolerance	•	•		•		•
Wide T range	•	•	•			

We hope that the provided answers and additional information provides the clarification needed. Our response can be published and made public. If there are any further questions or if you want to have a further discussion on the provided information, please do let us know.

Kind regards,

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Bruce Laprade
President of Photonis Scientific inc.

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