

# Questionnaire 1 (Clarification) Exemption 1(c) of RoHS Annex IV

Wording of the requested exemption:

*Lead, cadmium and mercury in infra-red light detectors*

Requested validity: *Maximum validity period (7 years)*

## 1. Background

Bio Innovation Service, UNITAR and Fraunhofer IZM have been appointed<sup>1</sup> 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.

PerkinElmer Ltd has submitted a request for the renewal of the above-mentioned exemption, which has been subject to a first review. As a result we have identified that there is some information 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 September 1<sup>st</sup> 2020 latest.

## 2. Acronyms and Definitions

MCT	mercury cadmium telluride
InAs	indium arsenic
GaSb	gallium antimony
FTIR	Fourier Transform Infra-Red

## 3. Questions

1. You request the renewal of exemption 1(c) for EEE of category 9 only. We assume that the category 9 devices which use the IR detectors are industrial monitoring and control instruments. If so, exemption 1(c) would expire in July 2024, i.e. in four years.

Could you please let us know why you request the renewal of the exemption now already?

Industrial monitoring and control instruments is defined by the RoHS Directive as “monitoring and control instruments designed for exclusively for industrial or professional use”. As this application is for equipment that will be used in applications such as manufacturing, forensics, pharmaceuticals, environmental testing and research and development, some of these applications would not fit solely under the definition of industrial or professional use. For example, MCT detectors are used in FTIR spectrometers and FTIR microscopes that are used by students in university and hospital settings.

<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

Perkin Elmer is requesting renewal of this exemption now to cover both non-industrial and industrial monitoring and control instruments to avoid duplication of effort. The justification for this exemption are identical for both non-industrial and industrial monitoring and control instruments. As outlined in the exemption renewal application the timescales of development of alternative solutions take a considerable amount of time due to the large amount of engineering effort required after a suitable detector becomes available. PerkinElmer invest a great deal into research and development of our products so any legislative changes, even in 4 years, are relevant and substitute designs are not expected to be ready before July 2031 (7 years after 2024).

2. MCT detectors have a high sensibility when they are cooled down to 77 K. For the applications that you mention, is a cooling system integrated into the detector?

Some MCT detectors have built-in Stirling Engine coolers. However more typically the detectors are integrated with dewars or similar and employ liquid-Nitrogen to cool down the detectors to achieve the desired performance.

3. You mention a technology currently commercially available (from Hamamatsu) based on InAs/GaSb that offers a wavelength range up to 14.3  $\mu\text{m}$  and a lower detectivity. Why can these alternative sensors not replace MCT sensors in less demanding applications?

The full wavelength range of MCT (to at least 25 $\mu\text{m}$ ) is utilized to identify substances, therefore a product which offers a reduction in wavelength range (to only 14  $\mu\text{m}$ ) would not offer analysis in regions where unique characteristics of substances would be identified. Lower detectivity would due to the square law relationship between the detectivity and measurement time the implications of the differences in detectivity will result in measurement times which are orders of magnitude longer (so be unsuitable for kinetic studies as well as being impractical when analyzing large numbers of samples). It should also be noted that there is a 50% reduction in sensitivity due to a reduction in photosensitive area, the detectivity values at higher wavelengths are reduced and array type detectors are not able to be supported by Hamamatsu (so cannot be used in IR microscopes, which require array detectors). Due to the combination of unique properties MCT offers in comparison no application PerkinElmer offer could be replaced with InAs/GaSb.

4. Can the exemption wording be specified for your applications as follows?

*Cadmium and mercury in infra-red detectors of Fourier transform infra-red (FTIR) spectrometers and FTIR microscopes*

For PerkinElmer applications the exemption wording would cover the required applications.

**Please note that answers to these questions will be published as 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.**