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|  | EUROPEAN COMMISSION  DIRECTORATE-GENERAL  ENVIRONMENT  Directorate G - Sustainable Development and Integration  **ENV.G.4 - Sustainable Production & Consumption** |

**DIRECTIVE 2002/95/EC**[[1]](#footnote-1)**ON THE RESTRICTION OF THE USE OF CERTAIN HAZARDOUS**

**SUBSTANCES IN ELECTRICAL AND ELECTRONIC EQUIPMENT (ROHS).**

**CHECK LIST FOR REQUESTS FOR ADDITIONAL EXEMPTIONS**

Industry has sent to the Commission’s services a number of requests for exemptions from

the requirements of the RoHS Directive that are additional to those currently covered by the study and the stakeholder consultation. In most cases these are not substantiated by scientific and technical evidence. The proposed check-list will enable the Technical Adaptation Committee (TAC) to carry out a first screening of the requests received. Proposals that successfully pass the screening process will then be considered for a possible exemption.

Article 4(1) of Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment1 provides ‘that from 1 July 2006, new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, PBB or PBDE.’ The Annex to the Directive lists a limited number of applications of lead, mercury, cadmium and hexavalent chromium, which are exempted from the requirements of Article 4(1).

Adaptation to scientific and technical progress is provided for under Article 5 of the Directive. Pursuant to Article 5(1): “Any amendments which are necessary in order to adapt the Annex to scientific and technical progress for the following purposes shall be adopted in accordance with the procedure referred to in Article 7(2):”

Article 5(1)(b) allows the exempting of materials and components of electrical and electronic equipment from Article 4(1) if their elimination or substitution via design changes or materials and components which do not require any of the materials or substances referred to therein is technically or scientifically impracticable, or where the negative environmental, health and/or consumer safety impacts caused by substitution are likely to outweigh the environmental, health and/or consumer safety benefits thereof. These terms of reference mean that the TAC cannot consider exemptions for any other reason, for example a justification based on increased costs.

In order to allow the TAC to consider submissions for additional exemptions, the information in Table I should be provided as a minimum requirement. The request for submissions must fulfil the criteria of Article 5(1)(b). The information provided should be supported, as far as possible, with relevant technical and scientific evidence.

**TABLE I – CHECK LIST**

**PROPOSALS FOR FURTHER EXEMPTIONS FROM THE REQUIREMENTS OF ARTICLE 4(1) OF**

**DIRECTIVE 2002/95/EC FOR SPECIFIC APPLICATIONS OF LEAD, MERCURY, CADMIUM,**

**HEXAVALENT CHROMIUM.**

**Submitted by: Test and Measurement Coalition**

The Test & Measurement Coalition includes six leading companies producing Category 9 type products: Agilent Technologies, Anritsu, Fluke Corporation, Keithley Instruments, National Instruments, and Tektronix.

| **Criteria** | **Information:**  **Please provide supporting technical and scientific evidence** |
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| **1.** Please indicate the specific application for which the exemption is requested and indicate a precise and clear wording for the new exemption.  Please describe the material/component of the electrical and electronic equipment that contains the hazardous substance.  Please indicate the functionality of the substance in the material of the equipment.  Provide a detailed description of the application which explains why the restricted substance is currently required or used.  Please indicate the quantity of the hazardous substance present in the whole equipment (Kg). | Lead used in compliant pin connector systems for use in monitoring and control instruments (Category 9).  This exemption is needed for making compliant pin connectors using alloys containing lead. There is widespread use of lead within compliant pin connector systems within monitoring and control instruments, including many custom parts. Some example end use applications are:   * Oscilloscopes * Signal Generators * Audio Analyzers * Wireless Communications Test Set * Programmable power Supply * Noise Analyzer * EMI Receiver   As described by Oeko Institute report of 19 Feb. 2009, compliant pin connector or press-fit connectors systems provide a method of attachment and electrical contact between a connector and printed circuit board (PCB) which does not require a soldering operation. The pin contacts are inserted into plated through holes (PTH) in the PCB and the mechanical design of the pin provides reliable electrical contact.  The compliant pins must be sufficiently flexible to deform as they are inserted into the holes without an excessively high force that might damage the plating in the holes. They also need to be extractable for repair without damage to the board.  The use of lead is critical for Category 9 products to guarantee high and long term reliability. The continued use of these components is necessary as the technology is proven, reliable and safe. |
| **2.** Please explain why the elimination or substitution of the hazardous substance via design changes of materials and components is currently technically or scientifically impracticable. | The long-term reliability of all alternatives to compliant pin connector systems has not been fully evaluated for our applications. Our products have long life time of 10 years on average; therefore substitutes should be tested not only for meeting reliability requirements but also for long term performance, going substantially beyond the one of consumer goods applications. |
| **3.** Please indicate if the negative environmental, health and/or consumer safety impacts caused by substitution are likely to outweigh the environmental, health and/or consumer safety benefits.  If existing, please refer to relevant studies on negative impacts caused by substitution. | The exemption is critical to high reliability connectors. Since the alternatives are new it has not yet been possible to put them through environment aging tests to ascertain long term reliability in all our applications.  The environmental impacts of any substitutes can only be established once a technical substitute has been proven. |
| **4.** Please indicate if feasible substitutes currently exist in an industrial and/or commercial (please provide reference for the substitutes).  If substitutes exist on the market, please indicate why they are not used. Please indicate in which applications they are used.  Please indicate what efforts are being made by your company to develop alternative techniques.  Please indicate if the alternative techniques will be available by 1 July 2006 or at a later stage. If not by that date, please indicate when you expect an alternative to be available? | Several potential substitutes are under investigation; however the research and tests performed so far do not conclude that these are viable alternatives for Category 9 applications.  **Tin**  Although in 2004 several compliant pin connector manufacturers claimed that tin can replace tin/lead coatings, the tests performed did not come to a conclusive result, despite intensive research.  The main concern with tin is the growth of tin whiskers which occur on electroplated tin coatings. Tin whiskers have been shown to cause short circuits in electrical equipment leading to either intermittent faults or complete, catastrophic failures.  To date, there is no single compliant pin system manufacturer able to supply lead-free product. Despite intensive research, no alternatives were found so far for Category 9 specific applications which can guarantee high reliability.  **Gold**  Gold coatings are resistant against whisker growth, however the tests performed so far indicate that gold could not be a viable option for compliant pin connectors. The main reason is the required insertion force of gold press-fits which often results in unacceptable damage to the plated through holes (PTH).  **Potential design changes to decrease the insertion force**  Tests have been performed to reduce the insertion force by increasing the PTH diameter or decreasing the pin thickness. The results however were not positive as these changes resulted in compromising the reliability of the connector.  **Time needed for finding suitable alternatives**  No suitable alternatives for Category 9 applications have been found so far, despite intensive research. Even if new alternatives become available, they will require extensive testing to verify their long-term reliability when used in Category 9 products.  Historically, material or component substitutions have been validated through a number of tests under extreme conditions. Testing programs can last one or two years.  **We therefore request that the exemption applies until 2021 for all Monitoring and Control products (aligned with typical product lifecycles and the first review of Exemptions for Category 9.)** |
| **5.** Please provide any other relevant information that would support your application for an additional exemption. | If the exemption is not granted for Category 9 Monitoring and Control the additional time needed for adaptation and redesign of the sector’s portfolios would be considerable. This change of direction due to unavailability of this substance exemption would cause massive withdrawal of products from the EU market. This would have very serious consequences, not only for Category 9 producers, but also on client industries which are of key importance for the EU economy and competitiveness such as communication, defense, research & development, aerospace, electronic manufacture, etc.  The effort and costs required to recollect part data, review and redesign products is disproportionate compared to gains that can be obtained in other areas.  **Specificity of Category 9 Sector**  Professional Test & Measurement products include a wide range of sophisticated electronic instruments including electronic counters, signal generators, logic analyzers, oscilloscopes, network analyzers, spectrum analyzers, power meters, multi-meters, signal analyzers, chemical and biological analyzers, and communications test equipment. The instruments are used by laboratories (for research and compliance evaluation), universities (for technical training and education), manufacturers (for product development and manufacturing of their products), and governmental agencies for conformance verification. They are essential to the good functioning of electronic communications networks, heavy industrial processes such as steel manufacturing, the testing of vehicles for compliance with emissions standards, and the monitoring of complex systems of all types.  Due to the specialized nature of the Test & Measurement subset of Category 9 products they contain a relatively high ratio of custom designed components compared to off-the- shelf components. Customers require that Test & Measurement products have greater bandwidth, speed, accuracy, and measurement precision than the products they themselves are producing.  Most of these Category 9 products serve industrial monitoring applications and are produced in vastly smaller quantities compared to categories already in scope of RoHS. The entirety of Category 9 product volumes in total is representative of less than 0.25% of e-waste, of which industrial Test & Measurement is a subset. Test & Measurement instruments are designed for high reliability and are considered company capital assets – not personal use products. Customers expect to use these instruments for a minimum of ten years and for manufacturers to provide upgrades to expand instrument functionality on the basis of both number and type of measurements as well as additional analytical functionality during product life.  The ERA study did not consider this exemption in detail since it was foreseen to be available for medical or monitoring and control products.  No detailed impact assessment has been undertaken for Category 9 products as our sector has been out of scope prior to July 2011. Availability of the original set of RoHS Exemptions had been assumed as intimated from relevant parties including the EU Commission during the development of the RoHS Recast.  Consequently, the long-term reliability of all alternatives has not been fully evaluated for our applications. Our products have long life time of 10 years at average; therefore substitutes should be tested not only for meeting reliability requirements but also for long term performance, going substantially beyond the one of consumer goods applications.  Any forced change would require significant data collection from the supply chain, product review, redesign and requalification. This effort and cost would be disproportionate to the benefits of short-term substitution for the limited application of these parts in the monitoring and control sector.  **References**:  Oeko Institute report “Adaptation to scientific and technical progress under Directive 2002/95/EC, 19 February 2009.” |

**Additional guidelines**

To support your application, it may be useful to provide, in addition, an assessment of your application from an independent expert. These should be accompanied by information that will allow the Commission and TAC to be satisfied that the consultant is independent and is qualified to assess the application.

Explain the reasons why potential alternative materials, designs or processes are unsuitable with quantitative data wherever possible. If possible, provide photographs or diagrams to illustrate claims. Sources of information should be referenced where possible.

1. OJ L 37, 13.2.2003, p. 19 [↑](#footnote-ref-1)