



**DIRECTIVE 2002/95/EC¹ 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.

¹OJ L 37, 13.2.2003, p. 19

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.

<p>Criteria</p>	<p>Information: Please provide supporting technical and scientific evidence</p>
<p>1. Please indicate the specific application for which the exemption is requested and indicate a precise and clear wording for the new exemption.</p> <p>Please describe the material/component of the electrical and electronic equipment that contains the hazardous substance.</p> <p>Please indicate the functionality of the substance in the material of the equipment.</p> <p>Provide a detailed description of the application which explains why the restricted substance is currently required or used.</p> <p>Please indicate the quantity of the hazardous substance present in the whole equipment (Kg).</p>	<p>Lead not exceeding 20% in bronze bearings and bushes in monitoring and control instruments (Category 9.)</p> <p>There exists a vast array of Category 9 applications and conditions for roller bearings and bush bearings in pumps compressors and turbines with rotating shafts. In contrast to vehicle applications, those in Category 9 vary from wide temperature applications such as cryogenic pumps, high pressures (1200 bar) in liquid chromatography analyzers and high volume pumps for emergency cooling to name just a few.</p> <p>Different bronze alloys are designed to cover specific conditions used in bearings and bushes for rotating shafts. One group of alloys known as high leaded bronze containing 4-20% lead, are used under specific operating conditions.</p> <p>Alloy C93200 (6-8%Pb) has a wider range of applicability, and is more often specified, than all other bearing materials. It is used for general utility applications under medium loads and speeds. Strengths and hardness are somewhat lower than those of the tin bronzes but this group of leaded alloys excels in their antifriction and machining properties. Alloy C93200 utilizes a combination of tin and zinc for cost-effective strengthening while C93700 (8-11% Pb) relies solely on tin to obtain the same strength level. In addition to its good strength, Alloy C93700 is known for its corrosion resistance to mildly acidic mine waters, and to mineral waters and paper mill sulfite liquors. Wear resistance is good at high speeds and under high-load, shock and vibration conditions. The alloy has fair casting properties, something to be considered when large or complex bearing shapes must be produced. Alloy C93700 also contains enough lead to permit use under doubtful or interruptible lubrication, but it must be used with hardened shafts. High strength is sacrificed for superior lubricity in the bronzes containing 15 and 25 percent lead - Alloys C93800 (15%Pb) and C94300 (25%Pb). These high-leaded tin bronzes embed dirt particles very well and conform easily to irregularities in shaft surfaces and permit use with unhardened</p>

Criteria	Information: Please provide supporting technical and scientific evidence
	<p>shafts. As in all leaded bronzes the lead is present as discrete microscopic particles. In alloys C93800 and C94300 there is ample lead available to smear onto the journal to prevent welding and seizing, if the lubricant supply is interrupted.</p> <p>Source Copper.org</p> <p>The use of lead is critical for cat. 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.</p>
<p>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.</p>	<p>Substitute materials may be available for some applications however the substitute materials cannot be investigated or implemented in a couple of years; the transition time for monitoring and control instruments is impracticable.</p> <p>All applications would be compliant using the original exemption of 2002/95/EC for lead in bronze bearings and bushes. The exemption in Annex III of 2011/65/EU for all product categories is too restrictive “refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications” for Category 9 applications where entry into force starts in July 2014. Since the specific conditions are so varied it is not economically viable to investigate and apply feasible substitutes until a product is replaced with a newer model.</p>
<p>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.</p>	<p>There are health and safety impacts if substituted materials cannot meet the required operating conditions, causing seizure of rotor shafts, vibration damage or other mechanical failures.</p> <p>Information on knowledge base is in the Oeko report</p>
<p>4. Please indicate if feasible substitutes currently exist in an industrial and/or commercial (please provide reference for the substitutes).</p> <p>If substitutes exist on the market, please indicate why they are not used. Please indicate in which applications they are used.</p> <p>Please indicate what efforts are being made by your company to develop alternative techniques.</p> <p>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</p>	<p>Availability of bronze bearings and bushes with lead not exceeding 4% for <u>all</u> monitoring and control instruments applications that currently use high leaded bronze alloys has not been established in the short time since the revised exemption 9b came into effect. This limits applications to lead in bearing shells and bushes for refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications.</p> <p>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.)</p>

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be available?	
<p>5. Please provide any other relevant information that would support your application for an additional exemption.</p>	<p>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, defence, research & development, aerospace, electronic manufacture, etc.</p> <p>Specificity of Category 9 Sector</p> <p>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.</p> <p>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.</p> <p>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.</p>

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	<p>The ERA study did not consider this exemption in detail since it was foreseen to be available for medical or monitoring and control products.</p> <p>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.</p> <p>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 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.</p> <p>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.</p> <p>References:</p> <p>Oeko Institute report “Adaptation to scientific and technical progress under Directive 2002/95/EC, 19 February 2009.”</p>

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.