



**DIRECTIVE 2002/95/EC<sup>1</sup> 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 equipment<sup>1</sup> 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.

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<sup>1</sup>OJ 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><b>Criteria</b></p>	<p><b>Information: Please provide supporting technical and scientific evidence</b></p>
<p><b>1.</b> 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>Cadmium and its compounds in electrical contacts or one shot pellet type thermal cut-offs with current ratings of 5 Amperes or more, for use in monitoring and control instruments (Category 9.)</p> <p>Use: Cadmium and its compounds are used as a contact material in a wide range of applications in switches, relays and contactors for switching current in high capacity equipment, motors and resistive loads.</p> <p>“Arc erosion resistance and welding resistance are improved by the addition of cadmium oxide to the silver matrix. The contact resistance is raised by this addition but still is low. Cadmium oxide and silver do not alloy so the silver matrix retains its high conductivity. Silver-cadmium oxide contacts are used in current ranges of a few amperes to several hundred amperes.</p> <p>Arcing causes fire in the presence of oxygen and welding of contacts prevents opening of contacts losing ability to switch equipment to the off state.</p> <p>AgCdO compositions of up to 30 % cadmium are made, but most applications use silver-cadmium oxide in the range of 10 to 15 % cadmium oxide by weight.”</p> <p><a href="#">Source</a> ASTM B781 Standard for Silver-Cadmium Oxide Contact Material</p>
<p><b>2.</b> 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><b>Substitute materials impact safety to users and shorten product life – see below for details</b></p>
<p><b>3.</b> Please indicate if the negative environmental, health and/or consumer safety impacts caused by substitution are likely to outweigh the environmental,</p>	<p>The negative safety impacts result from product safety event management of fire when arcing or welding of contacts is the root cause of failure.</p>

<b>Criteria</b>	<b>Information:</b> <b>Please provide supporting technical and scientific evidence</b>
<p>health and/or consumer safety benefits. If existing, please refer to relevant studies on negative impacts caused by substitution.</p>	<p>Downtime of equipment in industry is an economic factor that may incur financial penalties to the producer of the equipment including product recall and/or replacement.</p>
<p><b>4.</b> 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 be available?</p>	<p>No feasible substitute materials have been located that <u>reliably and safely</u> switch currents of 5 Amperes or more in the supply chain of contactors, relays and switches over an acceptable life time normally expressed in number of switch operations before failure.</p> <p>“Silver nickel is not suitable for higher current switching. The main alternatives to cadmium oxide in higher current switching are based on tin oxide and on zinc oxide, often with additional elements added, principally to modify the oxide particle size and shape. Both tin and zinc oxides have higher melting and boiling temperatures than cadmium oxide. They vaporize slower than cadmium oxide and so tend to build up on contact surfaces causing a gradual increase in contact resistance, as silver erodes. This increases the contact temperature which again may increase the wear rate and risk of welding.</p> <p>Many users of tin oxide and zinc oxide contacts report that these materials are unsatisfactory substitutes for AgCdO because they wear faster and so have shorter lifetimes.”</p> <p>Source: ERA on ex. 8, Document “RoHS exemption 8 technical information final.pdf”, submitted to Oeko Institute by Dr. Paul Goodman, ERA, in July 2008</p> <p>Producers of monitoring and control instruments rely on component suppliers of contactors, switches and relays to develop and make available alternative components</p> <p><b>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.)</b></p>
<p><b>5.</b> Please provide any other relevant information that would support your application for an additional exemption.</p>	<p>The application scope of the new exemption is narrowed compared to the original exemption 8 by limiting use to 5amperes or more in contacts.</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 &amp;</p>

Criteria	<b>Information:</b> <b>Please provide supporting technical and scientific evidence</b>
	<p>development, aerospace, electronic manufacture, etc.</p> <p><b>Specificity of Category 9 Sector</b></p> <p>Professional Test &amp; 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 &amp; 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 &amp; 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 &amp; Measurement is a subset. Test &amp; 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> <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</p>

<b>Criteria</b>	<b>Information:</b> <b>Please provide supporting technical and scientific evidence</b>
	<p>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><b>References:</b></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.