



**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.

¹ 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.

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represented by Jürgen Sturm, secretary general

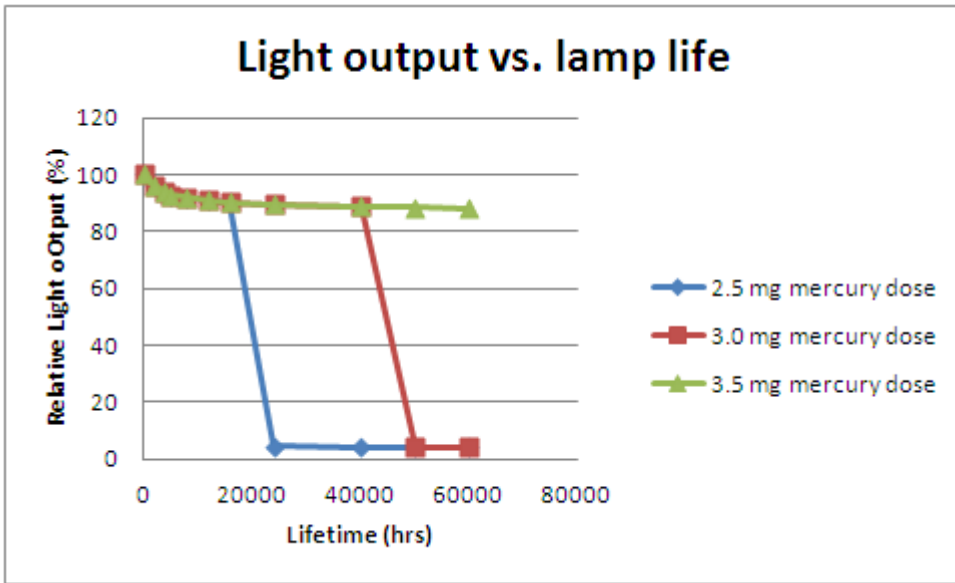
contact person: Attila Mórotz (tel: +32 2 706 8711)

Criteria	Information: Please provide supporting technical and scientific evidence
<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>The current exemption reads: Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):</p> <p>1.a For general lighting purposes < 30 W: 5 mg</p> <p>Expires on 31 December 2011; 3,5 mg may be used per burner after 31 December 2011 until 31 December 2012; 2,5 mg shall be used per burner after 31 December 2012.</p> <p>No specific category for longlife lamps is available in RoHS for single-capped (compact) fluorescent lamps. We request a new exemption for these lamps: 1(a)(1) For long-life lamps <30W (specified with a lifetime of >15 khrs) 3.5 mg may be used after 31 December 2011.</p> <p>Our request for exemption is complimentary to straight FL: distinction between normal and long life is accepted for straight fluorescent lamps, as long life lamp have more mercury consumption than normal lamps, due to their longer lifetime.</p> <p>The component containing mercury is the glass tube filled with mercury containing gas in fluorescent lamps.</p> <p>Mercury is an essential material to create the right plasma in the glass tubes of fluorescent lamps to generate visible light.</p> <p>Mercury is an essential material in all fluorescent lamps to create a high efficient radiation of light inside the lamp.</p> <p>The quantity of mercury per lamp is max. 3.5 mg in single capped fluorescent long-life lamps. In % of lamp weight: $0.0035/66 * 100 = 0,005\%$.</p>
	Mercury elimination is not possible for fluorescent lamps as it is

Criteria	Information: Please provide supporting technical and scientific evidence
<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>directly linked to high efficiency light production. Several other substances have been tested in the past, all resulting in a severely lower efficiency of the lamp.</p> <p>Due to a Mercury consumption effect inside the lamp during operation, too low Mercury dosage in lamps will lead to a severe light output failure during life and specifications of long life lamps cannot be met (see Annex 1, graph 1).</p> <p>For < 30W lamps: (RoHS requirements after 31 December 2012 are for mercury: max 2.5 mg). As is expressed in Annex 1 this level is suitable for life times < 20 khr , however too long life lamps. For these lamps 3.5 mg mercury is needed to avoid light output failures during life of the product. The current ROHS requirement of 2.5 mgr max after 31 Dec 2012 is therefore scientifically impracticable.</p> <p>For 30-50W: (ROHS requirement after 31 December 2012 is max. 3.5 mg). For long life lamps 3.5 mgr is needed to meet the specifications (see Annex 1 and 2). Therefore the current ROHS requirement of max 3.5 mg is practicable.</p> <p>Based on existing mercury consumption data the required mercury dose can be calculated by a statistical model, see Annex 2. This requirement on mercury dose is based on the following:</p> <ul style="list-style-type: none"> - Mercury may not be depleted before the specified lifetime in order to avoid light loss, as shown in Annex 2(see graph 1). - The measured spread due to mercury consumption processes is taken into account statistical tolerance range <p>A statistical tolerance can be set using a normal distribution of the mercury consumption data and a 6 sigma interval with a process capability of 1.33. Design for six sigma (DFSS) is a well known and sound statistical tolerance approach used in many industries.</p> <p>Based on this DFSS approach , the max mercury dose limit avoiding lamp defects due to mercury depletion can be calculated. This results in the required minimal dose limit indicated by the green line in graph 2 (boundary condition on max mercury dosing)</p> <ul style="list-style-type: none"> - In practice this line means that lifetime of lamps will not be jeopardized by too low mercury dose, leading to impracticable premature light loss (less than 32 ppm lamp defects will occur due to mercury depletion). The required ROHS dose limit is indicated by the green line in Annex 2. Based on this line we propose to use 3.5 mg mercury for long life lamps with lifetimes between 15-60 khrs. (see area right from red arrow) A 2.5 mg dose can be maintained for lamps with a lifetime below 15 khrs (see area left from red arrow)
<p>3. Please indicate if the negative</p>	<p>This is the trade –off between lamp life (so amount of waste disposal per year) and the mercury applied in the lamp.</p>

Criteria	Information: Please provide supporting technical and scientific evidence
<p>environmental, health and/or consumer safety impacts caused by substitution are likely to outweigh the environmental, health and/or consumer safety benefits.</p> <p>If existing, please refer to relevant studies on negative impacts caused by substitution.</p>	<p>Given the lifetime specification and mercury consumption measurements shown in Annex 1 and 2, the alternative would be to install more than 2 normal standard lamps instead of 1 longlife lamp during the lifespan of the longlife lamp. The total amount of mercury dosed for 2 lamps during lifetime then would be 5 mg. The total environmental impact is lower when one long life lamp is used with a total of 3.5 mgr of mercury.</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 be available?</p>	<p>Feasible alternatives do not exist currently.</p> <p>We continue to search for new innovations reducing the mercury consumption in a lamp. These innovations enabled lower Mercury limits in the RoHS legislation in the past.</p> <p>No solution is available nor known to further lower the mercury consumption in the lamp. The graph in Annex 2 shows the latest state of the art.</p>
<p>5. Please provide any other relevant information that would support your application for an additional exemption.</p>	<p>The exemption request is in line with the exemption currently applicable for long life straight fluorescent lamps. Longer life lamps in general need more mercury due to the mercury consumption process during life in the lamp. Long life lamps are used for special applications and cover a very limited part of the market</p>

Annex 1:



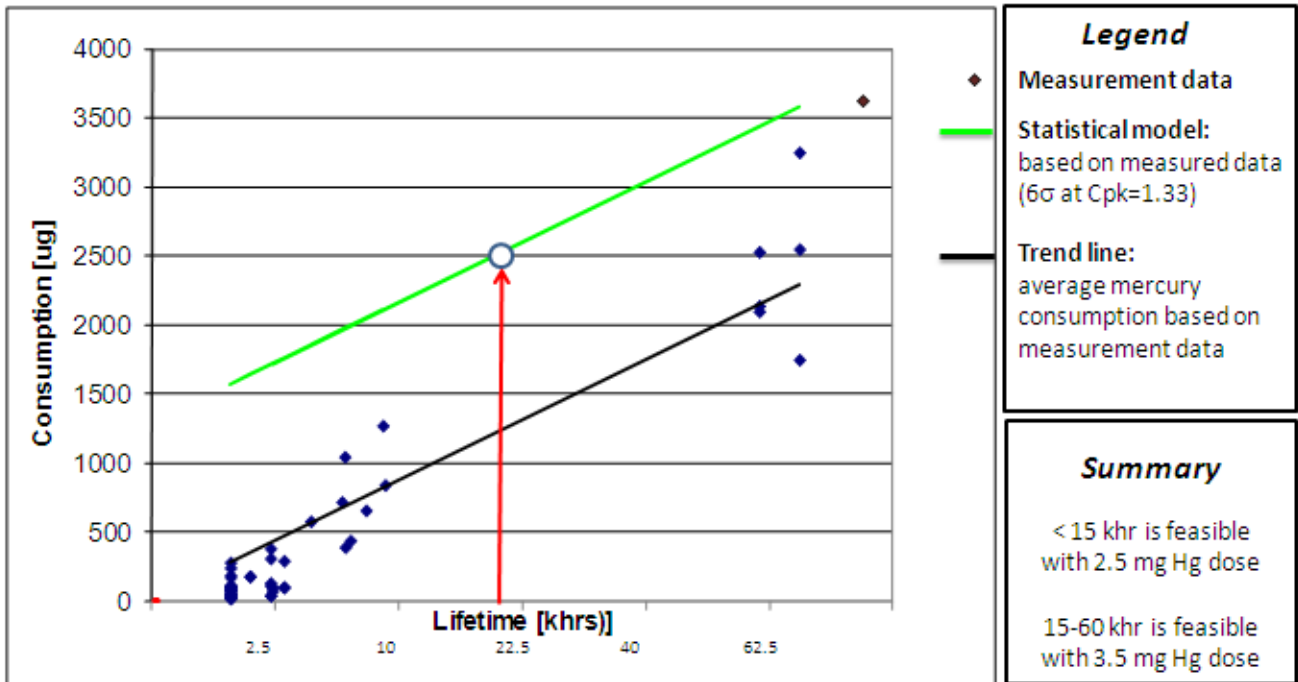
Graph 1.: Light output versus lifetime for different (maximum) mercury doses: 2.5, 3.0, 3.5 mgr

Conclusion: The light output drops dramatically when too low mercury doses are used.

A level of 3.5 mg is needed to assure lifetimes up to 60 khrs.

Annex 2

Mercury consumption and required max. dose for Long Life lamps



Graph 2: Required mercury dose as a function of lamp lifetime

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.