

Committee for Socio-economic Analysis (SEAC)

**Response to comments on the SEAC draft
opinion
on the Annex XV dossier proposing
restrictions on
Mercury in measuring devices**

ECHA/SEAC/RES-O-0000001363-81-03/S2

**Chemical name: Mercury
EC No.: 231-106-7
CAS No.: 7439-97-6**

15 September 2011

Substance: **Mercury**
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Comments and response to comments on SEAC draft opinion on Annex XV restriction dossier proposing restriction on **Mercury in measuring devices**.
 Annex XV report submitted by ECHA 15 June 2010.
 Public consultation on SEAC draft opinion started on 17 June 2011.

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66	2011/08/15 Germany / Industry or trade association	<p>Bundesverband Glasindustrie e.V. (BV Glas) is the Federal Organization representing the environmental, economic and energy-related interest of around 80 percent of the German Glass producing industry.</p> <p>There are only a few small and medium sized enterprises left that traditionally produce mercury containing thermometers. These enterprises are highly specialized and mainly located in rural areas, which is why they are important employers in their regions.</p> <p>The Opinion of SEAC suggests extending the restriction on the placing on the market of mercury containing thermometers to mercury-in-glass thermometers used in industry to measure temperatures above 200 degrees Celsius. SEAC argues that economically feasible alternatives are available. BV Glas rejects this assumption and requests SEAC to include derogation for mercury-in-glass thermometers used in industry to measure temperatures above 200 degrees Celsius in the final version of its Opinion. This is based on the following considerations:</p>	<p>Thank you for the comment and for the information.</p> <p>The <u>original</u> Annex XV dossier concluded that technical alternatives are available for industrial thermometers measuring temperatures above 200 °C. In the compliance cost calculations of the original Annex XV dossier (see Annex 5b) it was stated that substantial costs will be associated for users due to the higher investment costs, shorter average lifetime and the more frequent calibration of alternative devices. Therefore, it was concluded that the economic feasibility could not be established for industrial thermometers measuring temperatures above 200°C.</p> <p>However these calculations have been reconsidered by the dossier submitter and by SEAC. The Background Document now demonstrates the economic feasibility of alternatives for industrial thermometers for temperature measurements above 200°C. Alternatives have already taken over the market for industrial thermometers and labour time savings are thought to be the main driver for the observed changes in the market towards the use of electronic thermometers in industry. The additional annualised costs are estimated to be a relatively small percentage of the industrial users' total costs for purchases of goods and services and are expected to contribute only marginally to the final product cost. Furthermore, the alternatives have additional benefits over the mercury-containing devices which are not considered in the above estimate related to for example lower spill cleanup costs and lower waste disposal costs.</p>

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		<p>I. Designated restriction is not socio-economically feasible</p> <p>There is no economically and technically equivalent alternative available for mercury-in-glass thermometers used in industry to measure temperatures above 200 degrees Celsius. Accordingly, ECHA's "Annex XV restriction report: Mercury in measuring devices" of June 15, 2010 contains a derogation for such thermometers arguing: Alternatives are not economically feasible; some current standards refer to mercury thermometers and time is needed to revise them; mercury is one of the reference points needed in the International Temperature Scale(ITS 90). Possible alternatives are gallium-containing thermometers (see also point IV below) and electronic thermometers, but both types show severe economic and technical disadvantages. Electronic thermometers cannot be used for special kinds of measuring because their cases and sensors are not heat-resistant and/or chemical-resistant. They have a much slower reaction-time, which can lead to wrong evaluation of measuring results. The costs of gallium-containing thermometers are five times higher, the costs of electronic thermometers are three to five times higher than the costs of mercury-in-glass thermometers.</p>	<p>I. Regarding the socio-economic feasibility: see above.</p> <p>Regarding the technical feasibility:</p> <ul style="list-style-type: none"> - Electronic thermometers are generally more accurate than mercury-containing thermometers when properly calibrated (Lassen et al, 2008). - Electronic thermometers for measurements in adverse conditions have special encasings to improve the resistance to heat and/or chemicals of these thermosensitive elements. - In relation to reaction time of electronic thermometers, we have received so far no information to suspect that this would be an issue. On the contrary, evidence such as the response times of the high temperature electronic alternatives of one second (Amarell 2011) compared to available response times of several minutes for mercury-in-glass thermometers (Miller & Weber 2011) indicates that a slow reaction time is not an issue. In addition, the response times of electronic fever thermometers have been reported to be faster than for the mercury devices (Ng et al., 2002). Although the reaction time of electronic thermometers differs from mercury-in-glass thermometers, there are no reasons to presume a wrong evaluation of measuring results as users are informed and instructed how to use their instruments. - Traditionally many standards have prescribed mercury thermometers in analysis, many standards now allow for the use of alternatives (Lassen et al., 2010). There seems to be a need to amend standards that would not yet allow for alternatives to be used. In order to allow sufficient time to amend the standards, it is proposed to have a time-limited derogation (until 5 years after the date of adoption of the restriction) for thermometers exclusively intended to perform tests according to analytical standards (ISO, ASTM, etc.) that require the use of mercury thermometers. - The proposed restriction contains derogation for mercury triple point cells that are used for the calibration of platinum resistance thermometers (as prescribed in the 1990 International Temperature Scale, ITS-90). - Note that gallium thermometers are not considered to be direct alternatives to mercury thermometers in the assessment of alternatives; they are rather used in niche applications such as for measurements of temperatures outside the range for mercury-in-glass thermometers, for temperatures above 800°C.

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		<p>II. No negative impact on the environment or human health to be expected Mercury-in-glass thermometers used in industry are solely applied by trained professionals in closed-up facilities. During their entire life-cycle they are not available on the free market and thus never available for the public, which is why they cannot have a negative impact on human health. Most thermometers can be equipped with a Teflon coat, so that in case of damage the mercury is prevented from escaping. Broken or otherwise damaged thermometers can be sent back to its producer for recycling or environmentally sound disposal (this is being practiced by all members of BV Glas). Mercury can be gained from recycled material. In recent years, there have been no work-place related accidents in Germany, when dealing with mercury. Results of regularly conducted health controls of employees dealing with mercury don't show any exceedance of blood level limits. Hence the danger of harm for the environment or human health is extremely limited regarding the handling as well as the disposal of mercury-in-glass thermometers used in industry.</p>	<p>II. Concerning the risk related to the placing on the market of mercury thermometers and the appropriateness of the proposed restriction in terms of risk and risk reduction capacity, SEAC rapporteurs refer to the RAC opinion as published on ECHA's website. Furthermore, the SEAC opinion addresses the releases of mercury into the environment when devices enter the waste stage at the end of their life-cycle. The BD gives a rough indication that only 20% of the measuring devices are correctly collected and underlines the need to improve the collection rate of mercury measuring devices and to take adequate measures for proper waste management.</p>

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		<p>III. Measurement accuracy not achieved There is still no alternative available for mercury-in-glass thermometers available insofar highest precision and reliability are required. Electronic devices cannot achieve the same level of measurement accuracy. Especially in the case of reference measurements that require gauging/official calibration, the law requires the use of mercury-in-glass thermometers (this refers to the legal situation in Germany, which presumably is similar to the situation in other EU Member States). German law provides very limited exceptions for official calibration. Electronic thermometers usually cannot be officially calibrated, which is why they cannot be used for precision measuring that requires the highest level of accuracy and quality criteria. Furthermore, non-mercury-in-glass thermometers as well as electronic thermometers display wrong measuring due to slower reaction-time.</p>	<p>III. The rapporteurs have a different perception of the availability of alternatives. In addition the following remarks are made:</p> <ul style="list-style-type: none"> – Electronic thermometers are generally more accurate than mercury-containing thermometers when properly calibrated (Lassen et al, 2008). – In relation to reaction time of electronic thermometers, we have no information to suspect that this would be an issue. – On the issue that German law would provide very limited exceptions for official calibration, we studied the law in question that was sent to us as a follow-up to the comment by Bundesverband Glasindustrie e.V., and we could not see the legal basis of this statement: the law text that was provided seems to allow equally well for calibration of electronic thermometers. We conclude there is no information available to SEAC that German law would require the use of mercury thermometers (apart from possible references in law to standards that require the use of mercury thermometers, see point above on standards).
		<p>IV. Substitutes not equivalent All substitutes for mercury show deficiencies: wetting materials (e.g. pentane, ethyl alcohol, toluene or propylene carbonate) vaporize, ionic liquids separate and form particles. Gallium lubricates and is extremely hard to handle. All substitutes are less accurate than mercury. Electronic thermometers cannot – due to their construction – be used in all places where</p>	<p>IV. Also mercury instruments have deficiencies and regarding the accuracy the rapporteurs have a different view than expressed by the German papers that are cited and that we received. They only cover replacement of mercury-in-glass thermometers by liquid-in-glass thermometers. It is recognised that these liquid-in-glass thermometers have limitations in application areas, both concerning accuracy and temperature range. However, electronic alternatives can to our knowledge always be used. Electronic thermometers for measurements in adverse conditions have special encasings to protect sensitive</p>

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		<p>temperature measuring is necessary. In November 2007 a research project was completed by the German research community “Forschungsgemeinschaft Technik und Glas – Bronnbach e.V.”. A workable alternative to the use of mercury has not yet been found. Reason for this is that parts of the ionic liquid kept separating and vaporizing. The study has been continued by “Fraunhofer Institut für Silikatforschung” (ISC, a German institute for scientific research on silicate) in 2009. The interim report published on March 12, 2010 explicitly refers to the remaining problems that need to be solved in advance of an EU-wide restriction of mercury-in-glass thermometers used in industry. A survey conducted by Karl Heinz Lochner at ISC (published on May 14, 2008) states that the use of ionic liquids in precision thermometers is not yet practicable and therefore these liquids are not adequate substitutes for mercury. For this reason also, derogation for mercury-in-glass thermometers used in industry to measure temperatures above 200 degrees Celsius is absolutely necessary.</p> <p>Copies of the above mentioned reports and the survey are available (in German) from BV Glas upon request.</p>	<p>elements from chemical and thermal damage.</p>

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65	2011/08/12 Belgium / Industry or trade association/	The European Trade Union Confederation (ETUC) supports the proposed restriction on Mercury in measuring devices as presented in the SEAC draft opinion.	Thanks for the support.
63	2011/08/04 United Kingdom / Company- Manufacturer	Reproduction Mercury Barometers. The amounts of mercury involved in a reproduction mercury barometer is very small and once fixed to the wall the risk of contamination with lose of mercury is negligible. This is very different to a portable medical thermometer, manometer or equivalent which seems to determining the structure of this restriction. The only likely hood of damage is when the barometer is inexpertly moved by untrained removal firm staff. I would have thought it more sensible to enforce certification on transporting mercury barometers rather than deny production of an item, which if not made in the UK to satisfy the market, will certainly appear in counties where control is less monitored or non existent. I would advocate that the legislation be relaxed for this class of goods.	Disagree. It is clearly shown that there is no need to derogate the use of mercury in barometers as technically and economically alternatives are widely available. See Annex 1 in the BD. Experiences in the past demonstrate that incidents with mercury containing barometers regularly occur. For example, in 2009 and 2010 eight cases have been reported in the Netherlands. The rules for restriction cover the EU as a whole, assuring a level playing field within the EU. Further the import of mercury containing measuring devices is included in this restriction proposal.
61	2011/07/29 Belgium / International NGO	EEB would like to thank SEAC for the work that they have done on this important restriction dossier and for the account taken of several of our earlier comments. Regarding specific changes made to the restriction we have the following comment.	Thanks for the compliments and support.

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		<p>It is not clear who would qualify as having instruments intended for exhibition for ‘cultural and historical purposes’. As worded it would cover everything from major museums to individual collectors who could argue that they allow others to look at their collections. We suggest that SEAC advise that anyone who qualifies should be reminded of their responsibilities regarding the handling of mercury and its proper disposal.</p> <p>Regarding the derogation for sphygmomanometers to be used as reference standards in clinical validation studies of mercury-free sphygmomanometers. Perhaps this could be strengthened by reference to ‘certified laboratories or research centres’ as there may be a danger that the derogation could be used quite widely as a loophole.</p> <p>We support the call for the Commission to consider an export ban (page 5 of the draft opinion). We welcome the statements made on page 4 of the draft opinion on the need for improved waste collection for mercury. However, we remain concerned about the</p>	<p>We agree with EEB that the derogation for exhibitions could be further improved. Text is slightly changed: “...to be displayed in <u>public</u> exhibitions...”</p> <p>The issue of waste management is addressed in the SEAC opinion. The RAC opinion is dealing with the safe handling of the concerned instruments.</p> <p>Text is not changed. We understand the wish to further specify this derogation and to avoid any unnecessary use of mercury containing sphygmomanometers. However the proposal to add ‘certified laboratories or research centres’ could be too restrictive because clinical validation studies can also be carried out by hospitals or specialised (cardiovascular) centres. The possible users of the measuring devices should be able to show that the devices are used for clinical validation studies.</p> <p>Thanks.</p> <p>Agree. SEAC can support the view of RAC and also urges the Commission to look into this issue in a short period of time. The text has been modified in the opinion.</p>

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		<p>situation with respect to porosimetry. It is stated on page 9 that “Due to the high uncertainty in the technical feasibility of alternatives the placing on the market of porosimeters is proposed not to be restricted. Although porosimeters significantly contribute to the amount of mercury used in devices, action on a Community-wide basis for these devices is at present not justified.” Whilst we acknowledge the high uncertainty on technical feasibility of alternatives, we believe that acknowledgement should also be given to the high uncertainty regarding the fate of Hg used in porosimetry. Indeed, RAC (page 7 of their opinion) state that: “Another issue RAC would highlight is the necessity for addressing the use of mercury in porosimeters. The amount used is 5-14 t/y which is by far the biggest use in measuring equipment and the uncertainties regarding recycling/reuse are large. Consequently, RAC urges the Commission to look into this within a very short period of time and if appropriate propose new legislative measures e.g. a long transitional period to allow users to adapt to a ban”. We see no reason why SEAC should not support this view.</p>	