Contribution of the European sign Federation
Submitted to RoHS Exemption Stakeholder Consultation on 3 September 2012

Questionnaire Exemption Request No. 9

Exemption Request 9 "Mercury in cold cathode fluorescent lamps for luminous sign for advertising or decorative purposes (Category 5)"

For details, please check the applicant's exemption request at http://rohs.exemptions.oeko.info/index.php?id=139. This exemption request has been subject to a first completeness and plausibility check. The applicant has been requested to answer additional questions and to provide additional information (c.f. link above).

The objective of this consultation and the review process is to collect and to evaluate information and evidence according to the criteria listed in Art. 5 (1) (a) of Directive 2011/65/EU (RoHS II), which you can download from here:
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32011L0065:EN:NOT.

If you would like to contribute to the stakeholder consultation, please answer the following questions:

Questions

1. The applicant claims that CCFLs are used for **luminous sign for advertising or decorative purposes.** Do you agree with the scope of the exemption as proposed by the applicant? Please suggest an alternative wording and explain your proposal, if you do not agree with the proposed exemption wording.
   The emphasis should be clearly on the unique character of this type of CCFL which is hand made or tailor made, not mass produced. We would prefer to see the type description HLDT (hand made luminous discharge tube) for luminous signs for advertisement or decorative purposes, including general lighting purpose.

2. Please describe the different technical and performance characteristic[1] as well as the different shape, for comparison between the lamps for **luminous sign for advertising or decorative purposes** and the **lamps for general lighting purposes** (see also exemption request 8 at http://rohs.exemptions.oeko.info/index.php?id=138).
   Technically these are one and the same. We could classify upon diameter (below/above 18 mm) and running current (below/above 50 mA) but this is artificial. General lighting in a darker environment requires little power.
   HLDT with higher luminous flux are used for general illumination which requires a higher running current and suitable electrodes. However, would the same tube be used in a circuit with less current intensity then it would be called decorative. Because of this we would very much appreciate to see the present exemption requests nr 8 and nr 9 classified under the previous request nr 19 which covers all HLDT.

3. Furthermore, the applicant suggests 1,3 mg mercury per 100mm length in cold cathode fluorescent lamps **for luminous sign for advertising or decorative purposes**. Please state whether you either support the applicant's request or whether you would like to provide argumentation against the applicant's request. In both cases please provide detailed technical argumentation / evidence to support your statement. What could be the pro and cons between a mercury limit per 100 mm length and a maximum mercury content for these lamps.

   ESF does not support the applicant's request. Since 2007 our organisation is conducting enquiries and encourages the industry to reduce the quantity of mercury per tube, resulting in an overall reduction of 70% in the last 7 years.
   Although the most modern equipment has been introduced in processing and only those materials are selected for the manufacturing that absorb minimal mercury at this moment, broad experience in the field has shown that a limit of 40 mg per tube of 3m long is only possible for ideal operating conditions, and for limited life expectancy. As we cannot control the conditions our tubes will be used in we need to garantee they will equally function well in harsh outdoor conditions, especially in northern areas. Cold and humid conditions as well as heat are 'normal' conditions for our lamps. Large scale and expensive experiments have indicated the industry can only make reliable and lasting HLDT products if an upper limit of nearly 100 mg is used for tubes up to 3m long. For the same reason a similar exemption is granted in the U.S. IMERC (http://www.signs.org/Newsroom/IndustryNews/IndustryNewsItem.aspx?NewsID=2790)

   A linear approach may sound appealing in theory but is not practicable in this industry: we make tubes of 30 cm (with gas pressure up to 20 mbar unlike the 8 in the general description) up to 3m long, with a number of variations per day. Firstly, reliable methods to administer 2,6 mg to a very short tube are not available for a non-automated production. Secondly, we just know from experience this tube would only last a short time.

   A clear cut formula is not available on this short notice, that requires more time to elaborate and prove reliable. With ESF we have an engagement to constantly reduce the quantity of mercury per lamp every year, but according to levels imposed by our EQN label that have been proven to work during at least several years. We believe this is matching the spirit that RoHS expects the industry to adhere.

4. What is the influence of the application production technology on the amount of mercury needed for the lamp? How does the amount of mercury used in lamp production compare with the amount of mercury in the final product (lamp).

   As stated before, modern glasshops use the most modern production technology which lead to the very important reduction of mercury per tube in the last decade. Other, less well equiped glasshops can reach acceptable quality if some more time is allowed during the processing, if only the same limit of near 100 mg is used. The components to make tubes are sold by a very limited number of suppliers, but they all have state of the art experience. For instance, lead glass is no longer used, all coatings are triphospors, two major sources of mercury absorption in the past.

With modern processing all mercury that is used during lamp production stays in the tube. However it may become less available to light generation in time due the absorption and binding to other elements in the tube. That is why we must be sure that enough mercury will be available after enough time to generate light. Harsch conditions like cold and humidity contribute to early bindings of the mercury to other materials, leaving less for light.

5. Please provide test results/protocols that clearly indicate that CCFLs containing mercury deliver significant technical advantages over LEDs.

   HLDT can be individually tailor made to size, shape and light color based on customer request. The light output in 3D terms is the same over it's length, independent of angle.
   The efficiency of HLDT is higher than leds.
   HLDT function very well in hot environments without special cooling equipment.
   HLDT can be used in 3D applications without external frames or cabling.
   HLDT are 100% recycable and are handled by professional people only.
   HLDT do not require arsenic etc in their production phase.
   All these advantages are not applicable to leds.

6. Could you please elaborate more in detail the efforts which have been made to reduce mercury and/or respectively to manage the performance with the existing exemptions in CCFLs **for luminous signs for advertising or decorative purposes** during the last three years?

   ESF, through it's EQN programme, evaluates every year the progress in technology and scientific research and sets limits for the following year. This has helped us to reduce gradually to less than 50% from the level of three years ago and less than 70% from the level of ten years ago.