

## **EU environmental directive endangers present and future technical civilization**

The present draft report for the revision of the EU directive 2002/95/EC on the Restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS recast) will most likely cause the elimination of optical glass in such electrical and electronic equipment, one of the central key enabling materials of present and future technical civilization.

To avoid this result we ask the members of the European Parliament:

- to exempt optical glass and optical glass ceramic in total and without any expiry dates from the RoHS substances prohibition list;
- not to include additional substances as hazardous in the RoHS recast.

### **The importance of optical glass**

Optical glasses, coloured filter glasses and special optical glasses have manifold applications spread all over total industry, medicine, scientific research, safety installations and environment surveillance. In most cases, they are only a small part of the equipment falling under the substance restrictions of the RoHS-directive, but provide the essential functions like the magnification in microscopes, precision in measurement equipment, imaging in cameras and so on. Even industries that are not directly associated with optical systems rely on their function. The automotive, aviation, construction and even the food industry need optical measurement equipment for machine alignment and quality inspection. Among many other applications, coloured glasses provide safety with laser applications, object surveillance and airport lighting for example. Fluorescence microscopy, a method widely used in medicine, stands and falls with the existence of special optical glass types.

### **Why is the future use and development of optical glass substantially endangered?**

In order to achieve the required large variety of properties of optical glass types, combinations of different elements must be used out of a set of more than 50 chemical elements. In a single glass type there are typically 6 to 12 elements. Which elements and in what composition depends on the desired properties. For less critical applications there may be different compositions possible. However, there are specific properties that can only be delivered with one unique composition. Therefore, either the necessary elements must be used or the applications are not possible.

RoHS has put chemical elements on a prohibition list. In its first version it contained lead, cadmium, mercury and chromium VI. Lead is the element which was used in the past for high refractive index glass types. It has been replaced by other elements in a voluntary development of the optical industry in the 1990s in all cases where it was possible. Consumer optics nowadays uses lead free glass types. For special applications like fluorescence microscopy, however, the replacement glass types are not capable to provide all required properties. Lead containing glass types are an essential prerequisite not only for fluorescence microscopy but also for other applications. Therefore, an exemption has been granted until 30.06.2010 und thus has to be prolonged soon. The same holds for cadmium containing glasses, which also provide key properties without any replacement possibilities.

In amendment 69 of her draft report on the proposal for a RoHS recast<sup>1</sup>, Ms Jill Evans (MEP) as Rapporteur proposes to include further substances in the RoHS directive. Arsenic compounds and antimony trioxide are on this list, with the possibility to apply for exemptions. The exemptions will be granted for four years on detailed

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<sup>1</sup> Draft report on the proposal for a directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast) (COM(2008)0908 – C6-0471/2008 – 2008/0240(COD)) from 22.10.2009.

case-by-case studies only. Prolongations are possible but need detailed analyses again. Glass types subject to exemptions will have reliable delivery periods of four years maximum and six months at minimum. The inclusion of further substances is against the recommendation of a study commissioned by the Commission. In the final report of the study of the Ökoinstitut of October 17<sup>th</sup>, 2008, "**Study on Hazardous Substances in Electrical and Electronic Equipment, Not Regulated by the RoHS Directive**", it is written: "Due to the fact that the application of diarsenic trioxide/arsenic trioxide seems to be restricted to glasses and glass ceramics where it is not present in its original chemical form, it is not further considered in the present study". In addition, this study states clearly that there is "currently no action necessary for antimony and arsenic oxides".

Optical system designs need typically two years from start to first glass purchase. In high end industrial optics the used glass types must be available for at least ten years, as industry needs supply chain security. This means that the supply of glass types subject to exemption applications will become too uncertain to be used. With the elements to be put newly on the prohibition list (arsenic, antimony, later probably nickel and additional heavy metal elements) most or even all optical glass types will be affected.

From the point of view of the protection of human health and the environment there seems to be no need to cover these substances additionally under the RoHS directive, because such critical substances are already very strictly assessed under the REACH regulation. For example, arsenic trioxide is on the candidate list of substances of very high concern (SVHC). SVHC can be included in Annex XIV of REACH. Companies who wish to use this substance then have to apply for authorisation for each use. This will probably decrease the application of this substance. So a restriction under RoHS would be double regulation which leads to an overwhelming bureaucracy and is unacceptable for the industry.

For many special glass types, production volumes and hence turnover are so small that neither an exemption application nor a redevelopment would be economically justifiable, if technically feasible at all. This would evoke the end of the optical industry, all photonics technology developments as promoted and funded by the EU and in the end all industry relying on optical systems.

### **What to do?**

Optical glass and optical glass ceramics must be exempted in total and without any expiry dates from the RoHS substances prohibition list. Due to its very widespread use, exemptions for specific applications are not practicable. Because there is only a limited amount of chemical elements available, there are hardly any replacement possibilities. Hence, pressure on suppliers to develop alternatives will have no real effect. Since optical glass is a very small business even compared with the optical industry, the glass suppliers cannot bear additional financial burdens. And since they are so essential for industry in total, they should be supported rather than put under pressure.

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