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European Commission
DG Environment
Unit G4 - Consultations Directive 2002/95/EC
B-1049 Brussels
Belgium

30 June 2004

Dear Sir/Madam

Subject: Stakeholder Consultation on Adaptation to Scientific and Technical Progress under Directive 2002/95/EC for the purpose of a possible amendment of the Annex

Re: item 7 of the Consultation Document; lead and cadmium in optical glass

We are contacting you in response to the above consultation round, to request that the Annex to Directive 2002/95/EC ("RoHS") be amended to grant an exemption from the Directive in respect of the use of lead and cadmium in optical and filter glass.

Thales Group is a major European manufacturer of optical modules and components, supplying to customers throughout the European Union and worldwide. Some of our products utilize of necessity lead-containing optical glass and/or cadmium-containing colour filter glass and are incorporated into electronic equipment, and would therefore be affected by the Directive.

We wish to draw the Commission's attention to the adverse effect upon both industry and consumers should lead – and cadmium – containing glasses be banned as a result of the Directive – as will be the case should the Annex not be amended to grant an exemption.

First, we comment upon the issues surrounding use of lead in clear optical glass.

Traditionally, many optical glasses have incorporated lead oxide, sometimes in very significant proportion. Since 1995, however, optical glass manufacturers have introduced a number of lead-free alternatives – the so-called "Eco" glasses.

Certain of the optical, thermal and mechanical properties of the lead-free glasses are not identical to the properties of the lead-containing equivalent.

The Thales Group actively supports the use of environmentally-friendly materials, and it is our policy to change our optical designs to use the new lead-free glasses, wherever this is possible without affecting optical performance. We apply this

policy (for both environmental and commercial reasons) to products for delivery both within and outside the EU, including products not forming part of electronic equipment.

In some cases it is advantageous technically to use the 'Eco' glass types compared to the traditional types. For example, lead-free glasses are generally easier to polish than their traditional lead-containing counterparts. Also, lead-free glasses are often less dense, which can be helpful where weight reduction is important.

In a small number of circumstances, however, it is not possible to realize an acceptable optical design without recourse to lead-containing glasses. This is due to the differences in properties between lead-free and traditional glass materials. Optical glass manufacturers assure us that they are unable to exactly simulate in a lead-free substitute all the properties of lead-based glasses, so that although "substitutes" exist these are not necessarily "equivalents".

Cases where we continue to specify lead-containing glasses include:

- Optical systems that are required to maintain focus with temperature ("athermal" systems) – it is frequently not possible to achieve an athermal design without recourse to lead-containing glass. Examples include military sighting systems and the like.
- Products that are required to provide high quality imagery over a wide spectral range, where the optical aberration "secondary spectrum" must be minimized – it is usually the case that minimization of secondary spectrum requires the inclusion of lead-based glasses as opposed to their lead-free equivalents. Examples include digital projectors of the type now commonplace in homes and business premises.
- Certain types of digital projectors also require the use of lead-based glass for approximately zero stress-optical coefficient, or to maximize transmission in the blue region of the spectrum – lead-free materials with the required properties being unavailable.
- Cemented doublets (ie two different glass elements cemented together) – it is important that the coefficients of thermal expansion of the two glasses are similar, and this is not always possible using lead-free material. Examples include aircraft head-up and head-down displays.

If the Directive is enacted as currently drafted, products such as the above (for delivery within the EU) will have to be re-designed to comply with the legislation. This will mean, in all the above cases, that the optical performance of the products will be significantly degraded. For example, so-called athermal systems will no longer be athermal ie they will go out of focus with changes in temperature.

Considerable cost will also be incurred in re-designing existing products (for delivery within the EU) to eliminate lead-based glasses. It is probable that we would continue to specify lead-containing glasses for products deliverable outside the EU, as not to do so would put us at a considerable commercial disadvantage compared to non-EU optical manufacturers.

Elimination of lead-containing glass from all products will, therefore, in our opinion be disadvantageous to both industry and consumers.

We further are of the opinion that the environmental impact of lead within optical glass is relatively minor, especially when compared to some of the other requests for exemptions from the Directive being considered by the Commission.

Turning now to the use of cadmium in coloured filter glass, we understand from filter glass manufacturers that cadmium is used as the colouring agent in numerous yellow, orange and red filter glasses, and that there is no substitute for cadmium in these materials. The proportion of cadmium is less than 1%. Some filter glasses also contain lead, but we are not sure (from manufacturer's information) whether this can be substituted.

Cadmium-containing filter glass is used in numerous products, including digital projectors, military sighting systems, covert surveillance products, many TV cameras and laser protection eye-wear.

A potential substitute technology for cadmium-containing filter glass is multi-layer dielectric coatings on a clear glass substrate. Such coatings are generally very expensive and have inferior spectral transmission properties compared to coloured filter glass. In particular, the properties of multi-layer dielectric coatings vary with incidence angle, whereas the behaviour of coloured filter glass is substantially constant with angle. Therefore such coatings are generally not suitable substitutes for coloured glass.

Notwithstanding our desire to reduce the environmental impact of our products, we do not currently have a policy of eliminating cadmium-containing glasses from our products. This is because we are not aware of any reasonable substitute.

Should cadmium-containing filter glass become unavailable as a result of the "RoHS" Directive, we believe this would have significant negative impact upon numerous products where spectral filtering is required.

Taking into consideration the points we have made above, we consider the most appropriate course of action is for the Commission to amend the Annex to the Directive, with the effect of granting an exemption from the Directive in relation to lead and cadmium in optical glass and colour filter glass, and we request – by this letter – that the Commission do so. This would not prevent us, in accordance with our environmental policy, from voluntarily eliminating lead-based glass where this is possible without affecting optical performance.

The Commission's Stakeholder Consultation Document requires that in this representation we address the following three specific issues:

Do feasible substitutes currently exist in an industrial and/or commercial scale?

Answer: in the case of lead-containing glass, a qualified "yes" in the majority of cases, but in certain circumstances (examples of which were given above) the answer is "no". In the case of cadmium-containing colour filter glass: "no".

Do any restrictions apply to such substitutes?

Answer: "no".

What are the costs and benefits and advantages and disadvantages of such substitutes?

Answers:

1. the cost of substitute raw materials is generally 10 – 15% higher;
2. in certain cases lead-free substitutes are beneficial in reducing glass polishing costs;
3. substitutes can also be advantageous in reducing product weight;
4. in a minority of cases – as outlined earlier – substitutes (or alleged substitutes) can be very disadvantageous, in that the optical performance of the product is significantly degraded compared to an equivalent product using containing lead and cadmium.

In conclusion, we thank the Commission for offering us the opportunity to make this representation. We repeat our belief that, in order to avoid significant negative impact upon both industry and consumers, it is appropriate that the Commission amend the Annex to the Directive to grant an exemption from the Directive in relation to lead and cadmium in optical glass. At the same time, the Thales Group will continue to voluntarily eliminate lead from our products where it is not technically disadvantageous.

Yours faithfully,



Jean-Yves Haagen
Thales UK Company Secretary



Andy Low
Thales UK Technical Director