

Test & Measurement Coalition

Introduction to the request for exemptions to apply to category 9

Exemption for “Mercury in cold cathode fluorescent lamps (CCFL) for back-lighting liquid crystal displays not exceeding 5 mg per lamp used in industrial monitoring and control instruments (only sub-category 9 industrial)”

Background

This exemption was very widely used in category 9 equipment and therefore affects large numbers of equipment on the way to obsolescence. A huge data gathering exercise to ascertain the scope of needed replacements which serves little purpose as the equipment is being transitioned already though possibly not all in time for the 2017 deadline. Backlit mercury displays are used for readability of the equipment in bright, sunlight conditions and are solely supplied by third party vendors. Their replacement would require review and potential redesign of the video interface to the integrated display. Due to the equipment longevity there is also a need to ensure a supply of replacements for existing screens remains available to extend the support life of pre-RoHS equipment. For some time already newly designed equipment has minimized the use of mercury backlit displays where feasible. All new equipment is being developed on the basis of LED based backlighting and the problems mainly occur in a limited set of larger screen older equipment types. The coalition estimates that the cost of replacement and redesign, testing and normalization of the remaining older-design equipment is disproportionate to the return in terms of environmental benefits. Category 9 equipment is almost never land filled or incinerated and more often taken back, refitted and / or recycled.

The Test & Measurement sector

The Test & Measurement coalition represents over half of the world’s industrial / professional test and measurement equipment manufacturers, including Agilent, Anritsu, Fluke, Keithley, National Instruments and Tektronix. The coalition members specialize in high end, very complex test and measurement instruments, classified under RoHS as industrial monitoring and control instruments, which are designed for exclusively industrial or professional use. The complex, advanced technology of the components present in this sector’s product renders the transitioning to new RoHS compliant parts more difficult than for other companies in the electronics market as outlined below and confirmed by numerous parliament sanctioned RoHS consultants:

- 1) The coalition members’ products are used to design and build cutting edge technological equipment and are themselves therefore one step more advanced and complex than any

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product developed or manufactured utilizing our Industrial monitoring and Control instruments. This places extraordinary constraints as regards to reliability, performance and quality, quite unlike consumer equipment;

- 2) Unlike most commonly available electronics, approximately 15-20% of all parts used in instruments manufactured by the Coalition members are custom made. Redesign is therefore both specific and does not benefit from any efficiencies of scale such as manufacturers of mass-produced parts enjoy;
- 3) As measurement equipment, many of the coalition member's products need to undergo formal third-party qualification and / or certification. This process is lengthy and bureaucratic and requires additional review upon any material change to the instrument;
- 4) Test & Measurement equipment have an average life span of 10 years with some products sold with guarantees to operate correctly for as long as 30 years;
- 5) Test & Measurement equipment, because of its longevity and complexity, goes through less frequent and slower redesign cycles than typical consumer electronics. Normally a full redesign isn't done for a minimum of 3 years, and 7 year redesign intervals are not unusual. Once undertaken, the time required to redesign and fully requalify a product can take two to three years. For a more limited enhancement of a product a year is not unusual. A ground-up development and design of a completely new product can take even longer, on the order of 3 - 5 years. The Coalition member's companies have specialized resources in place to deal with such cycles under normal conditions but would not be able to undertake unplanned rapid redesigns of existing equipment driven by unexpected exemption withdrawals;
- 6) Unlike other sectors, Coalition members produce a huge quantity of different kinds of products in rather low volumes (sometimes as few as one instrument sold a year). The extremely high technical level at which these instruments are manufactured and the limited pool of specialized engineers compared to the number of products results in further slowing the redesign cycles. By way of example – Agilent, the largest manufacturer produces approximately 27,000 different types of instruments compared for example to Nokia, a well-known consumer goods manufacturer, who has no more than 30¹ different product subject to ROHS but ten times the number of engineers. The seeming slowness in transitioning by industrial category 9 is therefore not due to a lack of effort or willingness but simply by the sheer scale and limited human, technical and financial resources available to make the transition;

¹ From Nokia's corporate website: <http://investors.nokia.com/phoenix.zhtml?c=107224&p=irol-productPortfolio>

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- 7) Test and Measurement product complexity is reflected in part count, which can be several thousands of components in a single instrument. This adds to the burden of developing appropriate materials compliance systems that provide reconcilable proof of compliance. Furthermore, many parts have multiple suppliers to assure production. This multiplies the number of suppliers' declarations required;

Socio-economic effects if exemptions are not granted

The loss of expected exemptions has five key socio-economic impacts to the Measurement and Control industry due to rework of previously completed activities:

1. Compliance IT Systems for data storage and product-level compliance analysis must be reviewed and potentially reconfigured to account for unexpected exemption withdrawals.
2. Renewal of Supplier's declarations for any part relying on an expired exemption where there is no clear mapping or equivalent in the new exemption structure.
3. Products developed and released to the market which were expected to meet the RoHS Substance Restrictions will have to be re-evaluated after new part compliance data has been obtained.
4. Exemption 20a concerns a minute amount of mercury whereas due to the nature of displays as fixed in place parts of the instrument the replacement is NEVER a drop in replacement. It requires changes to the very structure of the instrument with all the consequences that it entails, this is not economically and environmentally sound policy to do given the negligible amount of mercury involved.
5. Given that the products have very long lifetimes and are generally repurposed or recycled they comprise only a tiny part of the total waste stream, the environmental benefits that might be obtained are minimal whereas the economic and social effects of product withdrawal and the lack of access to T&M equipment for EU industries would be tremendous.

These impacts cannot be resolved simply by adding more engineering effort. All five aspects would take away existing resources from planned new product development activities. This effectively penalizes manufacturers who invested resources in developing RoHS compliant products in parallel to the regulations development to bring them into scope.

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Rationale for exemption 20a

- 1) Most T&M equipment contains a display of some sort – many of these relied in the past on mercury lamps to ensure readability of the display under all conditions. Due to the sometimes critical uses of the equipment (which cannot be predicted exactly) the use of crystal clear displays is essential and possibly life saving;
- 2) The coalition estimates fewer than 5000 lamps are put on the market in the EU each year and the total amount of mercury in them is 24 grams or less. This amount is decreasing every year and will converge to zero by the mid 2020ies.
- 3) The substitution activity is not possible as switching display units is not generally a drop-in replacement activity, especially when the type of display is changed (e.g. from CCFL to LED backlighting). The display shape and size may force changes to the product enclosure and the change in control circuitry can demand board redesign. Engineering resources are required for such redesign and also to re-qualify the product for performance, reliability and regulatory compliance. Resources already committed to meeting the RoHS transition date via portfolio conversion can't be diverted to this activity without impacting schedule and cost and potentially forcing premature withdrawal of products from the EU market.
- 4) In addition to the resources needed make changes to existing products, the uncertainty surrounding the 2019 'hard stop' of placing on the market items not adhering to all RoHS requirements would potentially force the withdrawal of all rental, resale and reconditioned products with these displays, thus increasing waste and impacting many small to medium enterprises who rely on being able to market these products for a long period of time.
- 5) The coalition notes that a single antique barometer contains ca. 400 grams of mercury – the effort to eliminate a minimal and decreasing amount of mercury put on the EU market for our category is completely disproportionate.
- 6) Coalition members have converted about 2/3 of their displays to new type displays without the offending lamps. This trend will continue and increase in pace even though we can already foresee it will not be possible to meet the 2017 deadline to transition all equipment. The aim is not product category specific because the substitution ability is partially related to how the fixed screen has been fitted into the equipment. The strategy for transition is that every redesign or redevelopment of the product will involve the phaseout of the mercury lamps >3.5mg and <5mg.
- 7) As far as we are aware manufacturers are indeed moving out of the market of >3.5 mg lamps although there is still one that delivers the lamp in question. Generally speaking some lifetime buys are involved in this case as well which are meant to assure functionality of the

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product over its entire lifetime (possibly even after refurbishment). This means that the displays will be in circulation well beyond the July 2017 date.