

Test & Measurement Coalition

Impacts of potential inclusion of new RoHS substances on Category 9 industrial sector

4 April 2014

Introduction to T&M Coalition

The Test & Measurement Coalition represents an ad-hoc group of companies active in producing Category 9 industrial type products. The Coalition includes six leading companies in the sector including Agilent Technologies, Anritsu, Fluke Corporation, Keithley Instruments, National Instruments, and Tektronix. We estimate the coalition membership represents roughly 60% of the global production of industrial test and measurement (T&M) products and other Category 9 industrial equipment including chemical analysers.

The Test & Measurement Coalition participated in the consultation rounds organised by Öko-Institut back in 2008 preparing the study on the RoHS substances in EEE in the context of the RoHS recast. We are pleased now to contribute with further input to the current study conducted by Öko-Institut on new RoHS substances.

Summary

As per our previous submission, we would like to stress that:

- RoHS substance restrictions do not yet apply to products in Category 9 industrial. Because of the specificity of the design process and the high reliability requirements, our products have been given a transitional period till mid 2017 for compliance with the current RoHS substances.
- Our products are expected to become RoHS compliant through our ongoing efforts to eliminate uses of the six RoHS substances. Our member companies have been working on product conversion since 2005 to be able to ensure RoHS compliance by 2017.
- If the scope of the RoHS restriction is extended to additional substances, Category 9 industrial should be exempted altogether in order to limit negative impact of withdrawal of products on the economy and innovation.

Specificity of Category 9 industrial equipment

Our products include a wide range of sophisticated electronic instruments such as signal generators, logic analyzers, oscilloscopes, spectrum analyzers, digital multimeters, chemical and biological analyzers etc. The instruments are used by laboratories (for research and compliance evaluation), universities (for technical training, education, and research), manufacturers (for product development and manufacturing of their products), and governmental agencies (for conformance verification). They are essential to the good functioning of electronic communications networks, heavy industrial processes such as steel manufacturing, the testing of vehicles for compliance with emissions standards, and the monitoring of complex systems of all types.

Category 9 industrial EEE is very different from the consumer goods high volume products.

- Test & Measurement products have a long product life up to 30 years and 10 years on average. Frequent redesign is not common for the sector, further emphasizing the need for extended transition periods to achieve compliance with existing resources.
- Test & Measurement products are extremely complex and there are a limited number of highly qualified engineers available to work on redesign. This will divert significant resources from the development of new, innovative products.
- Redesign often presents significant technical challenges that take time to resolve – it can be 1-2 years before a new product can be released and 0.5-1 year for an enhancement. A significant amount of the time is required for environmental and safety testing of new designs.
- 25 - 30% of the components used in Test & Measurement products are custom designed for our instruments. As many of our members use around 100,000 different parts today this means redesign and testing of several thousand custom parts for each company.
- Where RoHS compliant components are available, they require extensive testing to verify their long-term reliability when used in Test & Measurements products.
- Material substitutes meeting our customers' reliability criteria are limited in some instances. For example a domestic household product with expected life of five years has more material options for anti-corrosion coating than a Test & Measurement product for outdoor use which customers expect to work reliably for ten years or more.
- Historically, material or component substitutions have been validated through a number of tests under extreme conditions. Testing programmes can last one or two years.
- Category 9 industrial products' contribution to the stream of waste electrical and electronic equipment (WEEE) is insignificant – Category 9 products

represent only 0.25% by weight of the total WEEE in the waste stream. Category 9 industrial sector products represents an even smaller fraction.

The specific needs of Category 9 industrial taken into account in RoHS 1 and RoHS 2

Exclusion from the scope of RoHS 1

Category 9 was initially excluded from the scope of RoHS 1. At the time of the preparation of RoHS 1, the European Commission concluded that there was a lack of sufficient knowledge of the supply chain and waste flows of this category. In addition, it was noted from the very beginning that it would be difficult for this industry sector to comply with the directive's strict deadlines given the complexity of the products and the critical applications. This caution has been amply justified by the subsequent efforts required to identify and validate acceptable alternative materials suitable for long-lived, high reliability equipment and to transition large numbers of custom parts frequently sourced from SME suppliers – a task still in process of completion for RoHS 2.

Specific conditions foreseen for Category 9 industrial in RoHS 2

The Commission proposal brought Category 9 industrial into scope; but in the decision to do so did not suggest the extension of the substance scope at the time of the RoHS recast. The Commission proposed a long transitional period for Category 9 industrial products, extending to mid-2017. The Commission impact assessment¹ recognised that Category 9 industrial products are “produced in low numbers or have critical applications and hence increased testing and reliability requirements”. The Commission estimates that “the cost of RoHS compliance for some complex products could be as high as 7-10% of turnover (new product) or 1-10% (modification of existing product). A large part of this cost is attributable to the long development, testing and approval cycles of the more complex products. This is why a staged introduction for these products is proposed allowing the compliance conversion to take place in the framework of existing resources and product development cycles.”

Numerous amendments to the Commission text were proposed by the Parliament and the Council during the RoHS recast. Even so, the date of compliance for Category 9 industrial and the specific exemptions have not been put in to question. Moreover, the specificity of Category 9 was recognised by the Greens. In her report of December 2009, the rapporteur MEP Jill Evans, Greens, proposed an amendment² introducing new substance restrictions. Her amendment explicitly excluded Category 9 while foreseeing transitional periods for the other categories.

¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SEC:2008:2930:FIN:EN:PDF>

² Jill Evans report, Amendment 31: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+COMPARL+PE-430.424+03+DOC+PDF+V0//EN&language=EN>

Impossibility of compliance with potential RoHS substance extension

The Test & Measurement Coalition actively participated in the RoHS revision process, contributing to all studies and public consultations preparing the RoHS recast (ERA, Öko-Institut, and Bio Intelligence studies). In all our submissions we made clear that the ability to transition to RoHS compliance products by 2017 is strictly linked to the assumption that no new substances will be added, Category 9 industrial specific exemptions will be granted and old RoHS exemptions will continue to apply.

Category 9 industrial member companies of the Test & Measurement Coalition have been preparing for RoHS conversion of their products since 2005 and the reference for this is the current substance RoHS scope. Because of the product complexity, long lifetime – up to 30 years, and qualification tests for reliability which last at least 2 years – it is impossible to additionally comply with an extended substance scope.

Category 9 industrial companies have already faced the challenge of uncertainty about the availability of the old RoHS exemptions for which specific exemption applications had to be submitted right after the publication of the Directive and whose adoption took almost 2 years. We will not be in a position to meet 2017 deadline if additional burdens such as new substance restrictions are added.

Information about the presence of the priority substances in our products at the homogeneous material level is not yet available

Some of the 8 priority substances³ for restriction under RoHS have been included in the REACH candidate list and in this context our companies have received information about their presence in the supplied articles. It should be noted however that the REACH Article 33 communication obligation relates to a concentration level of 0.1% of the weight of the article and most custom part manufacturers have been able to provide data at only this level rather than per the homogeneous material level. Therefore this information is not sufficient for the purposes of determining compliance to potential RoHS restrictions for which the presence of the substance is assessed at the homogeneous material level.

It is anticipated that any attempt to add the priority substances to the scope for Category 9 products would require at a minimum a complete resurvey of the supply chain and, for SME custom part suppliers, the development of new processes and data management resources that have not been required for the current list of substances. Due to the nature of the current list of restricted substances, Category 9 industrial companies have been able to assume some of this burden on behalf of suppliers as simple screening methods (e.g. XRF) have been available to cross-check compliance in house, but this would not be the case for the proposed priority substances.

³ <http://rohs.exemptions.oeko.info/index.php?id=213>

Our products contain thousands of compounds provided by thousands of suppliers. If we are to start conducting a detailed investigation in the supply chain, it will take several years before we will be in a position to establish with reasonable degree of certainty the presence of the substances in the large number of custom parts utilized.

The lack of sufficient information in the supply chain was sufficient reason to exclude Category 9 from the scope of RoHS 1. We believe it is a serious reason to exclude Category 9 from new substance restrictions as well.

Long term reliability of alternatives should be evaluated for Category 9 Industrial

The research into alternatives for the RoHS priority substances, testing and evaluation of available substitutes and defining of transition programmes is not a priority as our companies are focusing all efforts on the implementation and verification of substitutes for the existing substances. In the preparatory phase of the RoHS recast we submitted substantial amount of information to the Commission, including very detailed company specific confidential information about internal substitution programmes, status of research, results and prospects, costs and investments, and human resources dedicated to RoHS conversion activities.

Our products have long life time of 10 years on average with many remaining in service for up to 30 years. Substitutes need to be tested to meet customers' expectations of long term reliability of products capable of consistently meeting published specifications. These requirements go substantially beyond those of consumer goods applications. Accelerated life testing can only result in a compression factor of 7 – hence 30 year reliability requires at least 4 years of testing. Furthermore unlike consumer goods manufacturers Test and Measurement companies have thousands of products and yet relatively small but expert engineering staffs. This places human limitations on the ability to transition that are not felt by other companies. The design cycle in consumer goods is between 6 months to a year whereas in Test & Measurement it can be as long as 3 to 5 years, or even longer if specific regulatory regimes require additional verification testing.

The Test and Measurement sector has invested millions of Euros in systems and data to support the development of RoHS compliant products with a view to meeting the intended compliance dates. Many products have already been introduced which have been designed to meet the substance restrictions. The investment in these product developments, the material compliance systems and supporting component data is all thrown into question if the new substance restrictions are to be added. 25-30% of parts used in T&M products are of non-generic design – this compares to less than 1% in consumer products – and not infrequently the substitution of one new RoHS compliant part can force additional substitutions and redesigns when a sub-component is not a true 'drop-in' replacement for the non-RoHS version. The exemptions from any further substance restrictions are therefore essential to maintain the path to transition to compliance in 2017 which can otherwise not be achieved.

The consequence of not exempting Category 9 industrial from new substance restrictions will cause massive disruptions in the production and use of T&M equipment across Europe.

Comments on the priority substances listed by Oeko Institut

1. Di-(2-ethylhexyl)phthalate (DEHP)

DEHP has pervasive known uses in Category 9 industrial PVC applications. Due to the large number of custom parts and the number of SMEs involved in their production, complete substitution of this material, if possible, is expected to take much longer in the category than in similar consumer electronics applications. The substitution effort is complicated by the effective 'gray-listing' of substitute plasticizer materials by their later addition to the REACH SVHC candidate list and similar lists generated worldwide. Substitution is additionally hampered by the unique nature of Category 9 industrial products which must maintain integrity over long lifetimes (up to 30 years) and in various harsh environmental conditions. An in-depth supply chain survey would be required to determine if there is additional unknown exposure at the homogeneous material level that would also need to be addressed.

2. Di-n-butyl phthalate (DBP)

In general DBP is not used in sector products at a level which must be reported under REACH. However, as the supply chain reporting is limited to the article-level assessment, an in-depth survey of the supply chain, including SME suppliers of custom parts, would be required to determine homogeneous material level exposure and complications inherent to requiring a substitution of this material.

3. Butyl benzyl phthalate (BBP)

In general BBP is not used in sector products at a level which must be reported under REACH. However, BBP is known to be used in some engineered plastics applications and an in-depth survey of the supply chain, including SME suppliers of custom parts, would be required to determine the degree of exposure at the homogeneous material level and consequent substitution-related issues.

4. Diisobutyl phthalate (DiBP)

In general DiBP is not used in sector products at a level which must be reported under REACH. However, as the supply chain reporting is limited to the article-level assessment, an in-depth survey of the supply chain, including SME suppliers of custom parts, would be required to determine homogeneous material level exposure and complications inherent to requiring a substitution of this material.

5. *Tris(2-chloroethyl)phosphate (TCEP)*

Chlorinated compounds remain pervasive in EEE. Due to the article-level reporting required to comply with REACH Article 33, there is limited knowledge available on whether custom part plastic sub-components contain TCEP at the homogeneous material level. An in-depth survey of the supply chain, including SME suppliers, is required in order to determine exposure and complications inherent to requiring a substitution of this material.

6. *Hexabromocyclododecane (HBCDD)*

Though HIPS containing HBCDD flame retardant is not generally used in product enclosures for Category 9 industrial products, brominated flame retardants not currently restricted under RoHS are still quite pervasive in the supply chain and are frequently noted in supplied article sub-components.

Due to the article-level reporting required to comply with REACH Article 33, there is limited knowledge available on whether sub-components contain HBCDD in HIPS or in the less common applications. An in-depth survey of the supply chain, including SME suppliers, is required in order to determine exposure and complications inherent to requiring a substitution of this material.

7. *2,3-dibromo-1-propanol*

There is limited knowledge available on whether custom part contain this substance at the homogeneous material level. An in-depth survey of the supply chain, including SME suppliers, is required in order to determine exposure and complications inherent to requiring a substitution of this material.

8. *Dibromoneopentyl-glycol*

Brominated flame retardants not currently restricted under RoHS are still quite pervasive in the supply chain and are frequently noted in supplied article sub-components. As this substance is listed with possible use as a flame retardant for epoxy, polyester, and urethane foams, an in-depth survey of the supply chain, including SME custom part suppliers, would be required to determine exposure and whether substitutions would impact safety or other certifications (e.g. for flame-retarded uses such as epoxy internal to power supplies.)