Approach on substance management and substitution – Case studies on certain CRM phase-outs

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EU RoHS (Restriction of certain Hazardous Substances) directive, originally belonging to WEEE, may have been the biggest source of the materials and substances change in EEE (electrical and electronic equipment). While the EU RoHS directive came to force on 1.7.2006 companies began to adapt to the forthcoming legislation already from the beginning of the 21st century. Fortunately the EU RoHS directive has been used as a basis for other countries RoHS type legislations and this benefits those companies that have already invested to be EU RoHS directive compliant.

Since then there has been introduced numerous legislations, which have either had direct impact on electronics or then on the chemicals used in electronic products e.g. REACH (Registration, Evaluation, Authorization and Restriction of Chemical substances).

Many companies have been introducing restrictions also on voluntary basis based on the precautionary principle e.g. halogen free materials. This has led to removal of some hazardous chemicals from the components and parts. However, when the original company specific lists are now compared against newest chemical legislations e.g. REACH, it can be seen that the restrictions introduced by companies have now found their way into the global legislations.

There are multiple methodologies in which to declare product compliance to various legislations; main methods are by testing or by Full Material Declarations (FMD). FMD offers many possibilities to react on new requirements and restrictions that cannot be reached by the testing of the products. Therefore companies have taken this approach in use. The FMD methodology gives also visibility on the use of the Critical Raw Materials (CRM) or Rare Earth Metals (RMD) in product level. Thus the initiatives of reducing CRM / REM can be initiated faster in companies having full material data of their products.

If and when substitutions are introduced there remains responsibility for the downstream user to ensure that the technological, environmental and socio-economic analysis have been performed before substitutions takes place. These principles will be described in the article for the benefit of the EEE design and manufacturing.

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Matti Rahko received his Ph.D. degree in Electronics department, Microelectronics and material physics laboratory from the University of Oulu, Finland on 2011.