



Plastic components of WEEE contain hazardous substances

A report has revealed that the plastic components of waste electrical and electronic equipment (WEEE) can contain significant amounts of hazardous substances, such as lead, mercury or certain flame retardants. The findings suggest that the plastics from some types of WEEE need to be treated as hazardous waste by waste managers and recyclers.

The European Commission's Directive on Waste Electrical and Electronic Equipment¹, which came into force in 2003, encourages EU Member States to reduce the amount of WEEE. It sets targets for recovery, re-use and recycling of the components of WEEE, including the substantial quantity of plastics they contain.

However, these plastic components can contain hazardous substances controlled by the Restriction on Hazardous Substances (RoHS) Directive². This Directive, adopted in 2003, requires Member States to ensure the quantity of certain hazardous substances in newly-manufactured electrical and electronic equipment is below a threshold maximum concentration value (MCV). This means that regulators and waste management companies need to understand how much of the controlled hazardous substances are found in WEEE and manage the plastics appropriately during recycling and re-use.

To estimate the amount of hazardous substances in the plastic fraction of WEEE, a team of researchers, partly funded by the EU's LIFE programme³, designed and carried out a practical study of samples of plastic from several different types of WEEE.

They found that plastics from each of the different types of WEEE contained at least one of the hazardous substances in measurable amounts. Heavy metals were found at the highest concentrations in small household appliances, ICT equipment and consumer equipment. High levels of brominated flame retardants, used to reduce the flammability of plastics, were found in small household appliances (including those that work at high temperatures), old cathode ray tube (CRT) monitors and consumer equipment, particularly CRT televisions.

The different types of WEEE were classified into four categories based on the concentrations of RoHS-controlled substances they contained. None of the different types of WEEE were placed in category A, for WEEE containing plastics where the levels of hazardous substances were at least one order of magnitude lower than the MCV. Category B, for plastic components with levels of hazardous substances just below the MCV contained four types of WEEE, including flat screen monitors, vacuum cleaners and some large household appliances. Category C included the majority of the WEEE types tested, all of which contain at least one RoHS substance at levels close to or above the MCV. The final category, D, for plastics with amounts of RoHS substances well above the MCV, contained just CRT televisions and monitors.

For waste managers, the results imply that they must be able to trace all mixed plastics from WEEE through the entire recycling chain. Recyclers have to ensure that they can separate plastics containing high levels of RoHS substances and dispose them of properly. The plastics fraction destined for a re-use in new products will have to comply with the the RoHS Directive.

1. See: http://ec.europa.eu/environment/waste/weee/legis_en.htm
2. See: <http://www.rohs.eu/english/index.html>
3. This study was conducted by the WEEELABEX project, coordinated by the WEEE Forum and co-financed by the European Commission's LIFE programme. See: www.weee-forum.org/weeelabexproject

Source: Wäger, P., Schluep, M., & Müller, E. (2010). *RoHS Substances in mixed plastics from Waste Electrical and Electronic Equipment*. Empa Final Report. Available online at: http://ewasteguide.info/files/Waeger_2010_Empa-WEEEFForum.pdf

Contact: Patrick.Waeger@empa.ch

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