

Under the WEEE Directive, it is unnecessary to separate plastics containing brominated flame retardants

Following recent studies and reviews, EBFRIIP recommends that, under the WEEE Directive, there is no need (legally or technically) to separate brominated flame retardants (BFRs) from other plastics in the waste treatment process.

WEEE separation requirements – the legislation:

EBFRIP believes that “Selective treatment of plastics containing BFRs”, as stated in Annex II of the WEEE Directive¹, can be fulfilled when such plastics waste is treated (recovered, recycled, thermally disposed) together with other wastes, as is the case with energy recovery processes. This means that it is legally and technically feasible to comply with the purpose of this Directive so as to ensure the safe selective treatment of WEEE without the removal requirement of Annex II. This is confirmed by Dr. Kristian Fischer of Mannheim University, who provided a legal expert review on the treatment of plastics containing BFRs under the WEEE Directive. In this paper, Dr Fischer states that “A *selective treatment does not appear necessary, however, if a joint recovery (of material or energy) together with the waste equipment can occur. The prior removal of the plastic parts that contain brominated flame retardants is then superfluous. This is because removal does not lead to any improvement in the level of health and environmental protection*”².

WEEE separation requirements – the practice:

Studies³ have shown that plastics containing specific BFRs in “closed loop”⁴ systems as well as high impact polystyrene (HIPS) with new DecaBDE can be recycled mechanically up to five times without losing their performance and have demonstrated that the German “Dioxin Ordinance” can be met, if mechanical recycling is done properly. Also, the removal of plastics containing BFRs makes sense in cases where a WEEE material is of a given size and quality so that its properties can be identified (for example through the use of infrared technology) and where it has market value as a secondary raw material.

Nonetheless, today in the majority of cases, separation does not make sense in practical terms. Removal of all plastics containing BFRs would require a total dismantling and separation of these small components from a complex waste stream. In the light of the increasing integration of plastic components with other materials (such as printed circuit boards and mobile phones) and continued product development such as miniaturisation technology, it is currently neither economically nor practically feasible for the waste management to separate the mixed material content. XRF technology for screening the presence of bromine is possible, but after using it an expensive analysis of PBBs or PBDEs is needed in case bromine is present. Technologies for handling plastics from E&E waste streams already exist⁵. Several studies⁶ demonstrate also that the most commonly used BFRs in EEE are fully compatible with integrated waste

management systems such as feedstock recycling and energy recovery. This shows that it is possible to handle E&E appliances composed of plastics containing BFRs in an environmentally manner while complying with the objectives of the WEEE Directive and without the need for separate treatment.

A working group to advise the EU Technical Adaptation Committee (TAC) of the WEEE Directive has drafted a guidance document to advise Member States on how to deal with the implementation of Annex II of this Directive as regards selective treatment of certain wastes and components. These EU guidelines are expected to be in place by 2006.

Conclusions:

- EBFRIIP supports the overall objectives of the WEEE Directive to increase the recovery of E&E waste while improving the level of health and environmental protection
- EBFRIIP recommends the use of feedstock recycling and energy recovery techniques for the treatment of WEEE plastics. Mechanical recycling is only recommended in specific cases such as in “closed loop” waste management systems.
- Technologies for handling plastics from E&E waste streams already exist and do not have a negative impact on the environment, on the waste management operations and/or on the final product.
- EBFRIIP considers that the separate removal of plastics containing BFRs is not necessary given that:
 - the whole appliance or qualified waste stream can be recovered by the appropriate feedstock recycling or energy recovery technology
 - eco-efficient waste management should be targeted
 - removal of plastics containing BFRs has no added benefit in terms of environmental or health protection.

Consequently, EBFRIIP recommends amending Annex II of the WEEE Directive as follows:

“Plastics containing brominated flame retardants, if the target of the selective treatment with respect to health and environmental protection cannot be assured also by a suitable downstream recovery (feedstock or energy) or thermal treatment process together with the old appliances”.

About WEEE:

The Directive on Waste Electrical and Electronic Equipment (WEEE)¹ aims to increase the collection, recycling and recovery of WEEE in Europe. According to the Directive, the operation of the take back system for WEEE collection as well as their treatment, recovery and disposal should have been installed by 13 August 2005. The set targets for recovery and recycling/reuse of collected E&E waste shall be reached by 31 December 2006.

References:

- ¹ Directive 2002/96/EC.. Annex II of the Directive deals with selective treatment for materials and components of WEEE and lists the substances and components to be removed from WEEE
- ² “The treatment of plastics containing brominated flame retardants in the EC Directive on Waste Electrical and Electronic Equipment – expert statement”, Dr. Kristian Fischer, c/o Chair for Public Law and Tax Law, Mannheim University as published in: K. Fischer, AbfallR, 3 (2004) 113-118
- ³ - “Determination of Polybrominated Diphenyl Ethers and PBDD/Fs during the Recycling of High Impact Polystyrene Containing Decabromodiphenylether and Antimony Oxide”. Chemosphere, 44/6 (2001) 1353-1360 Hamm, S.,Strickeling, M.,Ranken, P.,Rothenbacher, K.P, 2001
- “Comparison of the recyclability of flame-retarded plastics”; Environ Sci Technol. 2003 Feb 1;37(3):652-6; Imai T, Hamm S, Rothenbacher KP. Techno Polymer Co., Ltd., 100 Kawajiri-cho, Yokkaichi, Mie 510-0871, Japan
- ⁴ A “close loop” waste management system is one in which products are returned to producers for them to carry out the necessary recovery treatments.
- ⁵ “Waste electrical and electronic equipment plastics with brominated flame retardants - from legislation to separate treatment - thermal process”, Lein Tange, Dieter Drohmann, Polymer Degradation and Stability 88 (2005) 35-40, Elsevier, 2004
- ⁶ - Vehlow J, Tange L, Drohmann D, et al. Recycling of bromine from plastics containing brominated flame retardants in state-of the-art combustion facilities (2002) published by PlasticsEurope
- Vehlow J, Mark F. APME. Electrical and electronic plastics waste co-combustion with municipal solid waste for energy recovery. Available from: www.APME.com, 1997.
- Lehner T. Boliden E&HS aspects on metal recovery from electronic scrap, Conference Metal and Energy Recovery in Skelleftea in Sweden 25e26 June 2003, Website: www.recovery2003.skelleftea.se, 2003.