

FRENCH REPUBLIC  
**Ministry of Ecology, Sustainable Development and  
Energy**

Risk Prevention Department

Department of Prevention of Nuisances and  
Environmental Quality

Waste Management Policy Department

Office of Waste Management Planning

**Circular of 30 november 2012**  
**On the management of plastics from waste electrical and electronic equipment**  
**NOR: DEVP1238608C**

**Ministry of Ecology, Sustainable Development and Energy**

**to**

For enforcement:

Regional Prefects<sup>a</sup>

- Regional Department of the Environment, Planning and Housing
- Regional and inter Departmental Department of the Environment and Energy

Departmental Prefects<sup>b</sup>

- Department of the Environment, Planning and Housing

**Context:**

The selective collection of waste electrical and electronic equipment (WEEE) leads to the treatment of this waste in specialised facilities for purposes of decontamination and recycling. The recycling rate defined by the WEEE Directive requires that a significant proportion of the plastic fraction obtained be recycled, often after having been shredded. Plastics represent around 15% of all the WEEE categories (from 1 to 70% depending upon the appliance). The ADEME<sup>c</sup> register shows that 27 645 T of brominated plastics were removed for WEEE in 2010, corresponding to 6.76% of the streams treated by approved processes.

Due to the diverse range of appliances concerned (dates and places where manufactured) and the diverse range of resins and additives used it has proven necessary to clarify the conditions under which the plastic fractions, obtained following dismantling/shredding operations, are transported to recycling processes within the plastics industry. This especially focuses on facilitating the monitoring of the effective removal (or the non-combining) of items classified as hazardous waste in plastic waste batches marketed in France, within the Europe Community or exported.

**Summary:**

This circular provides different waste management examples in relation to the level of sorting of waste plastics coming from electrical and electronic equipment and containing brominated flame retardants. This circular provides the different treatment methods as well as the possible cross-border shipments.

<sup>a</sup> Regional prefects : French government administrative body at a regional level.

<sup>b</sup> Departmental prefects : French government administrative body acting at the level of a county (*département*) within a region.

<sup>c</sup> ADEME: French Environment and Energy Agency

Category:		Domain: Waste	
Closed list key words : Waste, plastics		Free key words: brominated flame retardants; waste electrical and electronic equipment	
Reference regulations:			
<ul style="list-style-type: none"> <li>- Regulation No 850/2004 of 29 April 2004 on persistent organic pollutants,</li> <li>- Title I and IV of volume V of the French Environmental Code,</li> <li>- The 2011/65/EC Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)</li> <li>- The 2002/96/EC Directive on waste electrical and electronic equipment (WEEE)</li> </ul>			
Repealed circular(s): None			
Appended(s) document(s):			
<ul style="list-style-type: none"> <li>•Appendix 1 – List of electrical and electronic equipment from which waste plastics from this equipment are assumed not to contain brominated flame retardants except where proven otherwise</li> <li>•Appendix 2 – List of sorting and identification technologies for BFR found in waste plastics from dismantled WEEE</li> <li>•Appendix 3 – Sorting of waste plastic fractions according to the presence or absence of bromine</li> <li>•Appendix 4 – Sorting of waste plastics according to the type of BFR</li> <li>•Appendix 5 – List of BRF and hazardous properties</li> </ul>			
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Brominated flame retardants are currently used as additives for manufacturing several products due to their flame retarding properties which slow down ignition and spread of flames. Furthermore, BFR can also be used together with enhancers to increase the effects of these flame retarding properties. BFR as well as the enhancers are especially present in plastics found in electrical and electronic equipment and are therefore found in waste electrical and electronic equipment (WEEE).

The main brominated flame retardants found in WEEE plastics are polybrominated diphenyl ethers (PBDE), tribromophenoxyethane (TBPE), polybromobiphenyl (PBB or HexaBB), pentabromo phenyl ethane (EBP), tetrabromobisphenol A (TBBPA) and hexabromocyclododecanes (HBCDD). Depending on the type of BFR, these substances can be carcinogens, irritants, ecotoxic or even toxic to reproduction. Furthermore, some BFR, especially PBB and PBDE and, in particular, C-pentaBDE, C-octaBDE, tetraBDE, pentaBDE, hexaBDE and heptaBDE, are also organic pollutants which persist in the environment (POP) and are therefore governed by regulation No 850/2004 of 29 April 2004 concerning persistent organic pollutants. Annex IV of the regulation lists the substances and concentration thresholds in waste at which treatment or recovery methods listed in Annex V become mandatory. The regulation is constantly changing. It is therefore necessary to ensure that the BFR present is not a new POP listed in the regulation.

The marketing, use and recovery of BFR are regulated under several directives and regulations at a European Community level: the 2011/65/EC Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS), modified regulation No 850/2004 on persistent organic pollutants as well as the 2002/96/EC Directive on waste electrical and electronic equipment (WEEE). Moreover, pursuant to the RoHS regulation, electrical and electronic equipment cannot contain more than 0.1% of PBB and PBDE.

Therefore the regulation applicable to brominated flame retardants varies according to the type of BFR, especially in relation to recycling methods. The BFR concentration in waste at which the waste can no longer be recovered as material depends on the BFR present. Furthermore, brominated flame retardants can have different hazardous properties as the waste plastics may or may not be hazardous depending on the amount of BFR present in the waste. Improved sorting would increase the quantities of plastics recycled in a closed loop, i.e. for the manufacture of EEE.

<sup>d</sup> OB – Official Bulletin

## **1. Sorting/transit/regrouping facility**

Waste electrical and electronic equipment sorting/transit/regrouping facilities listed under category 2711 of the ICPE<sup>e</sup> referencing system can accept WEEE coming from selective collection in particular. Sorting (separation of WEEE, or the parts used to make them, without affecting the physical integrity of the parts, for example the manual separation of plastic and metallic parts), regrouping and purely storage operations are conducted at these facilities.

The operations affecting the integrity of the parts of the waste electrical and electronic equipment (cutting, baling, etc.) must be listed under one of the two headings "other treatment methods": 2790 or 2791 of the ICPE referencing system according to how hazardous the plastics or other compounds are (heavy metals, PCB, refrigerants, etc.). In all cases, the degassing of refrigerants or mineral oil drainage (or containing PCB) must be considered as a hazardous waste treatment method.

The category 2711 groups together all WEE sorting/transit/regrouping activities, regardless of whether hazardous or non-hazardous waste is concerned. Evaluating whether or not BFR are present in plastics is not necessary for a facility to be listed under 2711. However, it would enable the management rules which should be applied to the waste plastics in the facility to be determined and to send this waste to the appropriate treatment process. Therefore, it is necessary to separate waste plastics coming from WEEE listed in Annex 1, from other types of waste plastics and, when possible, to separate other waste plastics according to whether or not bromine is present. Waste plastics coming from WEEE listed in Annex 1 could be sent to a 2714 or a 2791 facility and the other waste plastics must be sent to a 2718 or 2790 facility if they have not undergone an evaluation to determine the presence or absence of bromine or the level of danger they represent.

In terms of the rules for managing this waste in a facility, especially storage, operational measures may be adjusted for waste plastics containing BFR as the environmental impact only exists in the event that the waste is exposed to heat.

## **2. Facility treating plastics: shredding, thermal treatment and other types of recovery**

Knowing the BFR content is necessary in order that the streams are sent to the appropriate treatment process. This is why, once waste plastic batches are established, the operator managing shredding or final treatment must be aware of the BFR content in the plastics: on the one hand to avoid any pollution and to manage the risks related to workers' exposure when shredding and on the other hand to be able to send them to an appropriate disposal or recovery process.

Knowing whether or not a BFR is present or what type of BFR is present enable the possibilities of recycling and the level of danger of waste plastics to be determined.

### *2.1. Determining the type of authorised treatment processes for waste plastics coming from dismantled WEEE depending on their composition.*

Certain waste plastics from electrical and electronic waste can be considered free of BFR in the light of studies published on this topic<sup>1</sup>. These waste plastics are from C&F (Cooling and Freezing Appliances) and LHA (Large Household Appliances), identified in the WEEE directive under the category Mix of Large Household Appliances (C&F + LHA). A list of the EEE, from which waste plastics from dismantling are obtained and may be considered as not containing BFR, are given in Annex 1 of this circular.

Therefore, waste plastics coming from these WEEE streams can be recovered without specific restrictions.

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<sup>1</sup> Caractérisation des plastiques contenus dans les DEEE et état des lieux de la valorisation de ces plastiques, AJI-EUROPE pour le compte de l'ADEME, juillet 2005 (*Characterisation of plastics contained in WEEE and inventory of the recovery of these types of plastics, AJI-EUROPE on behalf of the ADEME, July 2005*)  
Concentration of RoHS substances in plastics from waste electrical and electronic equipment, EMPA, September 2010

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<sup>e</sup> ICPE = Installations classées pour la protection de l'environnement = Listed facilities which present a risk to the environment (eg. SEVESO). The definition of an ICPE facility is given in the French Environmental Code « Livre V, Titre I, art. L 511-1 du Code de l'environnement » (former du 19 July 1976 law)

Waste plastics from other WEEE streams are assumed to contain BFR. Therefore, determining the disposal or recovery process is related to:

- a) the level of sorting applied to the waste plastic fractions
- b) the regulatory restrictions related to each type of BFR.

To be recovered as material, waste plastics from WEEE must not contain any BFR listed in Annex IV of the POP regulation. Indeed, for "POP" BFR at a certain concentration level the only treatment methods authorised for waste containing BFR listed in Annex V of the regulation, are:

- physico-chemical processes (D9),
- incineration on land (D10) and,
- used principally as a fuel or other ways of producing energy (R1).

**Although requiring disposal, these waste plastics can be treated in a non-hazardous waste facility if the BFR concentration does not exceed the danger threshold values associated with these substances.**

***Certain BFR are listed in Annex IV of the POP regulation but do not have threshold values. In this case, the treatment methods listed above are not mandatory for treating these BFR. Studies at a European level are currently in progress, with the purpose being to establish threshold values at which material recovery will no longer be possible.***

The types of operations authorised on waste plastics from dismantling operations are determined by the level of sorting operations performed:

In the event that it is not possible to sort the waste, the presence of BFR is unknown and the potentially present BFR cannot be identified. No material recovery is authorised and the waste plastics fractions must undergo one of the three above-mentioned treatment processes (D9/D10/R1).

Level 1 sorting which consists in sorting according to whether or not there is a presence of bromine. Therefore "POP" BFR can be removed and thereby provide the possibility of recovering material. This type of sorting increases efficiency because all bromine-containing molecules are removed. A case study illustrating this sorting level is provided in Appendix 3.

Level 2 sorting which consists in separating the waste plastic fractions according to the type of BFR present. This level of sorting allows more waste plastics coming from dismantled WEEE to be recovered. A case study illustrating this sorting level is provided in Appendix 4.

Technologies which can provide a solution to the problem of identifying BFR in plastics from WEEE are listed in Appendix 2 of this circular. Furthermore, the state of the art of either existing waste sorting technologies or those being developed is provided in the ADEME<sup>2</sup> report entitled "Etat de l'art des technologies d'identification et de tri des déchets",<sup>f</sup> October 2010.

The recycling and recovery rate can only be achieved by optimising the recovery of all WEEE components. This is why it is necessary to carry out at least first level sorting.

**Recycling possibilities do not depend on the hazardous nature of waste but on the POP regulation and the various European Directives. Indeed, threshold values given in Annex IV of the POP regulation only represent the threshold value at which certain treatment processes are mandatory, but in no way assume the hazardous nature. A waste plastic containing BFR above the value indicated in the POP regulation will be subject to incineration which may take place in a non-hazardous waste treatment facility if the BFR concentration level does not exceed the threshold values published in article R541-10 of the French Environmental Code.**

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<sup>2</sup> <http://www2.ademe.fr/servlet/getDoc?cid=96&m=3&id=72479&p1=02&p2=05&ref=17597>

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<sup>f</sup> "State of the Art in Waste Identification and Sorting Technologies".

## 2.2 Evaluation of how dangerous waste plastics are from dismantled WEEE

Non-contaminated waste plastics from WEEE are potentially hazardous types of waste due to the presence of certain BFR conferring to the waste properties of a hazardous nature listed in article R541-8 of the French Environment Code. Depending upon the type of BFR and its level of concentration, the waste plastic could be a carcinogen, irritant, toxic to reproduction, mutagenic or even a hazard to the environment. The list of BFR and the associated properties of a hazardous nature are given in Appendix 5.

Careful, in certain cases BFR are introduced together with enhancers such as antimony. Therefore this waste's hazardous nature can also be associated with the presence of enhancers.

Waste plastics from C&F and LHA assumed not to contain BFR are considered to be non-hazardous waste.

In the absence of any analyses or proof to the contrary provided by the holder of the waste, all waste plastics from other types of WEEE are considered to be hazardous waste. However, the fact that waste plastic fractions from dismantled WEEE are hazardous due to the presence of BFR does not prohibit material to be recovered from these. Knowing the hazardous nature of these waste plastics is important for the classification of a treatment site in the event of cross border shipments.

### 3. Cross border shipments

The sorting level undertaken also affects cross borders shipments of waste because hazardous waste plastic fractions or waste which must be disposed of is subject to a notification and prior written agreement procedure in the case of shipments from within a member state of the European Union. It is strictly prohibited to export waste to a third party country for disposal except to countries which are part of the European Free Trade Association (EFTA) under certain conditions.

However, if the waste plastics batch is non-hazardous and intended for recovery, it can be exported using a simple information procedure in the case where export is to an EU member state or to an EFTA country. Exportation is also authorised to a country where the OECD Decision is applied by the enforcement of article 38 of regulation 1013/2006 as well as to countries party to the Basel Convention under which an agreement was established (refer to the regulation No 1418/2007).

On behalf of the Minister and by  
delegation  
Secretary General

Vincent MAZAURIC

On behalf of the Minister and by delegation

The Director General of Prevention of Risks



Laurent MICHEL

**Appendix 1 – List of electrical and electronic equipment from which waste plastics from this equipment are assumed not to contain brominated flame retardants except where proven otherwise**

Large cooling appliances

Refrigerators

Freezers

Other large appliances used for refrigeration, conservation and storage of food

Washing machines

Clothes dryers

Dish washing machines

Cookers

Electric stoves

Electric hot plates

Microwaves

Other large appliances used for cooking and other processing of food

Electric heating appliances

Electric radiators

Other large appliances for heating rooms, beds, seating furniture

Electric fans

Air conditioner appliances

Other fanning, exhaust ventilation and conditioning equipment

**Appendix 2 – List of sorting and identification technologies for BFR found in waste plastics from dismantled WEEE**

Sorting level	Techniques	Descripti
Presence or absence of bromine	XRT:	X-ray transmission  Detection: matter and in particular the presence of bromine
	XRF	X-ray fluorescence : this technology enables the total mass of bromine to be quantified  Detection: elementary atomic composition and mass concentration of each elements
	LIBS	Laser induced breakdown spectroscopy: (under development)  Detection: type of material and its composition
Sorting per type of BFR	NIR	Near-infrared spectrometry: This technology enables a flame retardant to be identified as it recognises molecular structure.
	Gas chromatography	Mass spectrometry

In 2010, the French competitiveness cluster, Axelera, launched the 'TRIPLE' project on the sorting of equipment plastics with the aim of proposing a standardised method for analysis of sources of plastics from WEEE and of optimising sorting techniques.

## **Appendix 3 –Sorting of waste plastic fractions according to the presence or absence of bromine**

### **Situation**

Sorting is performed in relation to the presence or absence of brominated compounds in each of the plastic fractions. Once sorted, two types of batches of waste can be identified:

- batch 1: waste plastic fractions with bromine
- batch 2: bromine-free waste plastic fractions and consequently not containing BFR.

### **Management of batch 1**

#### **Waste treatment method**

Batch 1 groups together waste plastic fractions containing bromine without distinguishing between the type of BFR present. The holder of the batch has waste assumed to be hazardous and potentially containing "POP" type BFR. Therefore, the only treatment methods authorised are:

- physico-chemical processes (D9),
- incineration on land (D10) and,
- used principally as a fuel or other ways of producing energy (R1).

#### **Cross-border shipments**

Given that this waste potentially contains BFR and therefore subject to disposal, it is subject to a notification procedure and can only be exported to an EU country, to an EFTA country or a countries party to the Basel Convention under certain conditions. These conditions are detailed in articles 34 to 35 of regulation 1013/2006.

### **Management of batch 2**

#### **Waste treatment method**

Once sorting has taken place, the holder must ensure that any BFR has been effectively removed by performing a statistical test on the batch of waste plastics said to be bromine-free. This statistical test must take into account the bromine content in each of the fractions and not the average content of bromine in the batch of plastic said to be bromine-free. The waste plastics no longer containing bromine can then be recovered and used for the manufacture of electrical and electronic equipment or, more widely, for the manufacture of other products.

#### **Cross-border shipments**

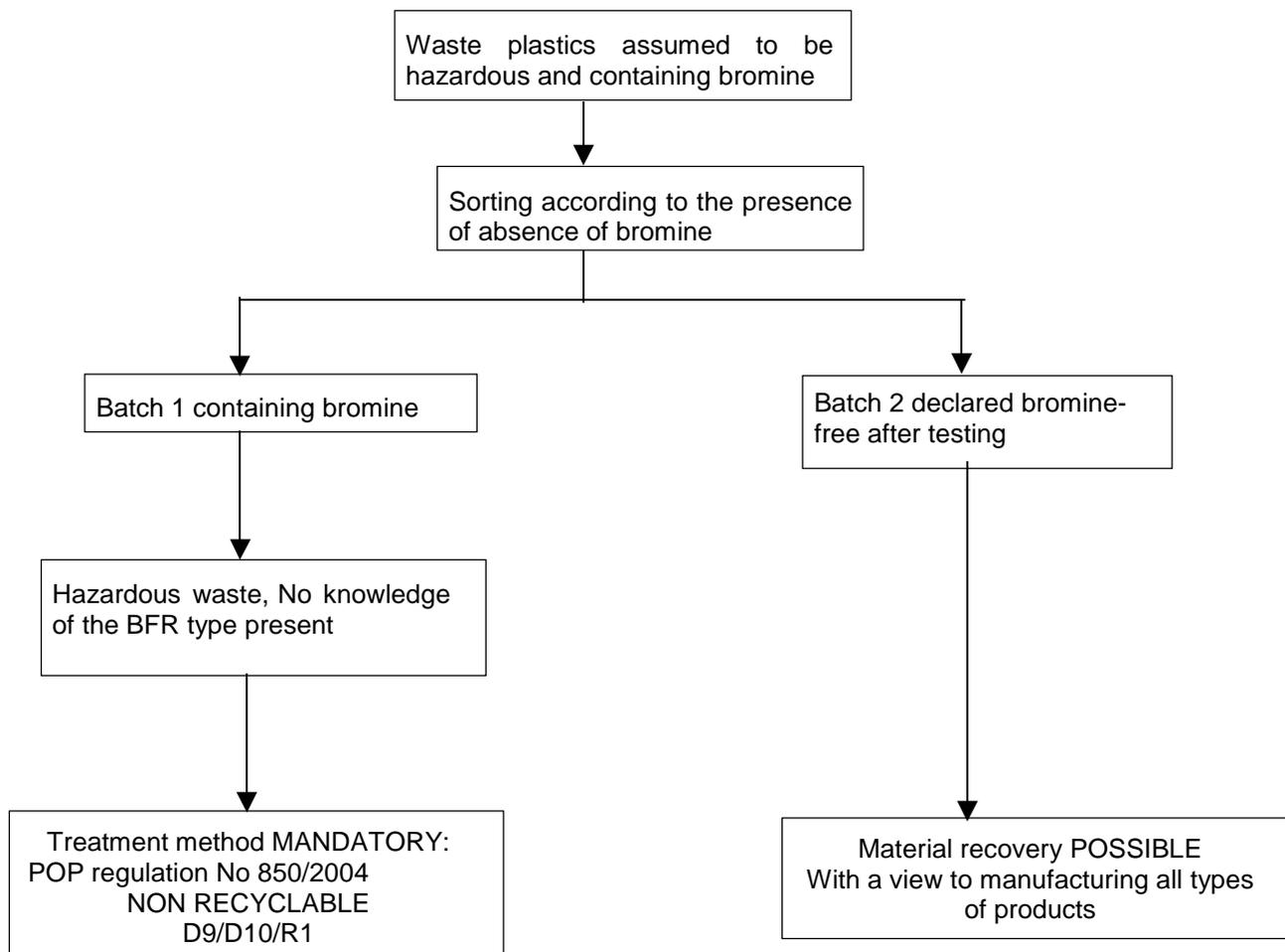
The waste plastics were initially potentially of a hazardous nature due to the presence of BFR. After sorting, Batch 2 no longer shows hazardous properties related to the presence of BFR. Therefore, the waste fulfils the conditions required to be listed in the green list of regulation 1013/2006.

If the batch of waste plastics is intended for disposal, a notification procedure is required for all exports to an EU member state. Although appearing on the green list, exporting these waste plastics for disposal to third-party countries is prohibited except to EFTA countries and countries party to the Basel Convention under certain conditions. These conditions are detailed in articles 34 to 35 of regulation 1013/2006.

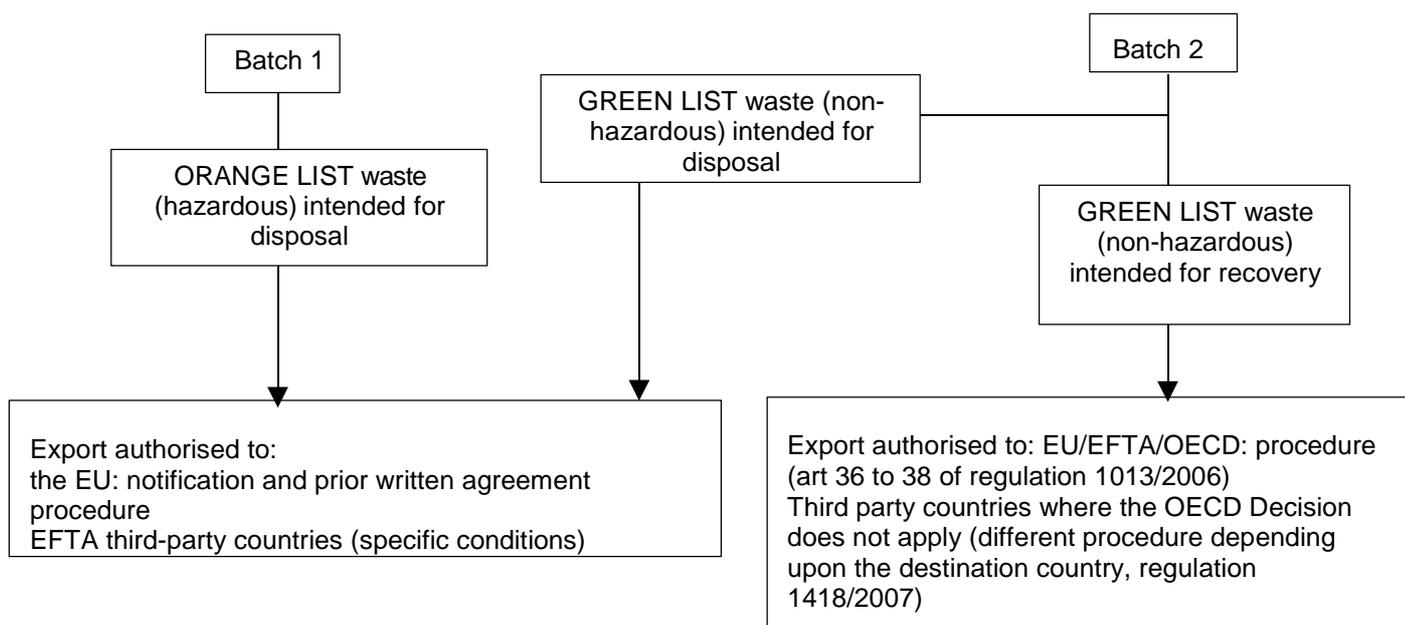
If the batch of waste plastics is intended for recovery, it can be exported using a simple information procedure in the case where export is to an EU member state. Exportation is also authorised to a country where the OECD Decision applies by enforcement of article 38 of regulation 1013/2006.

If exportation is to a country where the OECD Decision is applied, the holder must check if an agreement has been established between the EU and the destination country or if an agreement between France and the destination country has been established under regulation 1013/2006.

### Treatment method



### Exports



## **Appendix 4 –Sorting of waste plastics according to the type of BFR**

### **Situation**

This situation can be encountered when either recovering the waste plastics or during the first sorting exercise in the presence or absence of bromine (example 1, batch 1).

Depending upon the type of sorting of appliances carried out before dismantling and/or shredding operations, one fraction of waste plastics generally contains one type of BFR. Indeed, in a plastic item from electrical and electronic equipment, only one type of BFR is introduced to slow down any potential flame ignition.

Once sorted, several types of waste batches can be identified:

- batch 1: waste plastics containing « polyBDE » excluding decaBDE BFR: C-PentaBDE, C- OctaBDE, TetraBDE, PentaBDE, HexaBDE, HeptaBDE (listed in Annex IV of the POP regulation without threshold values).
- batch 2 : waste plastics containing BFR: PBB
- batch 3: waste plastics containing DecaBDE BFR and in this example, having been introduced with an enhancer
- batch 4: waste plastics containing HBCDD BFR
- batch 5: waste plastics not containing BFR

The BFR list provided is not exhaustive and in the case where other types of BFR in waste plastics are identified, the regulation's identification process must be carried out. For each type of BFR, it is necessary to take into consideration the regulation to be applied in terms of management, treatment method, level of danger and shipment. In particular, this concerns regulation No 850/2004 on persistent organic pollutants, regulation 1013/2006 on cross-border shipments and regulation 1418/2007 on exportation of certain waste types for recovery as well as definitions on properties and related threshold concentration levels and any other regulation which could have an impact on the management of the BFR present.

The management of different batches is provided as an example and enables the process to be illustrated. The holder of the waste must identify the BFR present **as well as the potential enhancers** and evaluate the hazardous properties associated with each one of them.

### **Management of batch 1**

#### **Waste treatment method**

Batch 1 groups together the fractions of waste plastics containing BFR listed in Annex IV of the POP regulation but for which no threshold values have been set.

The treatment methods listed in Annex V of the POP regulation are not mandatory for treating BFR. These waste plastics can therefore be recovered as material so long as no threshold values are set.

These waste plastics can be treated in a non-hazardous waste treatment facility if the BFR concentration level does not exceed the danger threshold values associated with these substances and listed in article R541-10 of the French Environmental Code.

#### **Cross-border shipments**

If a waste plastic has a BFR concentration level which does not exceed the threshold values set in article 541-8, the waste is considered to be a non-hazardous green list waste (code B3010). It can be exported under a simple information procedure. When the destination is a country where the OECD Decision is applied (article 38) exportation is also authorised. If exporting to a country where the OECD Decision is not applied, the holder must check if an agreement has been established between the EU and the destination country or if an agreement between France and the destination country has been established under regulation 1418/2007.

Hazardous waste plastics are subject to a notification procedure and can only be exported to an EU member state, to an EFTA country or countries party to the Basel Convention under certain conditions. These conditions are detailed in articles 34 and 35 of regulation 1013/2006.

## **Management of batch 2**

### **Waste treatment method**

Once sorted, the holder of the waste must ensure that no other types of BFR are present.

Batch 2 groups together the fractions of waste plastics containing « PBB » BFR. This BFR is listed in Annex IV of the POP regulation No 850/2004 and can be recovered or disposed of in other ways other than those cited in Annex V if the concentration of this substance in the waste is less than 0.005%. Beyond this PBB threshold value in waste plastics, recovery and disposal processes, other than those cited in Annex V, are prohibited for waste containing BFR. Therefore, the only treatment methods authorised for waste containing more than 0.005% of PBB are:

- physico-chemical processes (D9),
- incineration on land (D10) and,
- used principally as a fuel or other ways of producing energy (R1).

Below 0.005%, material recovery is authorised subject to compliance of regulations on the manufacture of products and EEE (RoHS Directive).

### **Cross-border shipments**

Taking into account the regulation on the management of this type of BFR, disposal of waste plastics containing more than 0.005% of PBB is mandatory and these are therefore subject to a notification procedure and can only be exported to an EU member state, to an EFTA country or countries party to the Basel Convention under certain conditions. These conditions are detailed in articles 34 to 35 of regulation 1013/2006. The same applies to waste intended for energy recovery and which contain more than 0.005% of PBB, the aim being to dispose of this substance.

Waste having a PBB concentration level of less than 0.005% and intended for recovery is subject to an information procedure under a green-list waste code.

In the case where the export destination is an EU member state, exportation takes place under a simple information procedure. This is also authorised to a country where the OECD Decision is applied (article 38).

If exportation is to a country where the OECD Decision is not applied, the holder must check if an agreement has been established between the EU and the destination country or if an agreement between France and the destination country has been established under regulations 1013/2003 and 1418/2007.

## **Management of batch 3**

### **Treatment method**

Once sorted, the holder must ensure that no other types of BFR are present.

Batch 3 groups together fractions of waste plastics containing “DecaBDE” BFR. Furthermore, in the current example, an enhancer has also been introduced with the DecaBDE and is therefore also present in this batch.

No regulation prohibits the recycling of waste plastics containing such BFR. These BFR are not governed by the POP regulation No 850/2004.

According to the ECHA database, which contains information on registered substances provided by companies in their registration file, DecaBDE is registered as an irritant (H319). Under article R541-8 of the French Environmental Code, waste plastics are hazardous if they contain more than 20% of DecaBDE. An evaluation of the hazard indications of the enhancer used should also be performed. It is then necessary to compare this substance’s concentration level with the threshold values set in article R541-8 of the French Environmental Code, the level at which the waste plastics are considered hazardous waste.

For concentration levels in DecaBDE and enhancers higher than the threshold values set in article 541-8, waste is considered as hazardous.

Material recovery of the fractions of waste plastics containing DecaBDE is possible regardless of whether or not the waste is hazardous, on condition that the regulations relative to the manufacture of products and EEE are adhered to (RoHS Directive).

### **Cross-border shipments**

If a waste plastic has a concentration level of DecaBDE lower than 20% and an enhancer concentration level which does not exceed the threshold values set in article 541-8, the waste is considered to be a non-hazardous green list waste (code B3010).

Export can be conducted under a simple information procedure. The procedures to be followed are identical to those given in Appendix 3, management of batch 2 example.

Hazardous waste plastics are subject to a notification procedure and can only be exported to an EU member state, to an EFTA country or countries party to the Basel Convention under certain conditions. These conditions are detailed in articles 34 to 35 of regulation 1013/2006.

### **Management of batch 4**

#### **Treatment method**

Once sorted, the holder must ensure that no other types of BFR are present.

Batch 4 groups together fractions of waste plastics containing "HBCDD" BFR. There are no regulations prohibiting the recycling of waste plastic containing such BFR. This type of BFR is not governed by the POP regulation No 850/2004.

HBCDD is not currently included in Annex 1 of the 67/548/EEC Directive nor the "CLP" regulation. Nevertheless a classification proposal aiming at ranking and labelling it as a potentially toxic substance to reproduction is currently being studied within the European Union (KEMI, 2009). On this basis, waste plastics containing 5% or more of HBCDD would be considered as hazardous.

According to the ECHA database, which contains information on registered substances provided by companies in their registration file, HBCDD is registered as an irritant (hazard references: H319/H335/H315) and as a substance hazardous to the environment (H400/H410 formerly NR50/53 and NR50).

Given that waste plastics have identical properties to those when it was in a 'product' state, it is necessary to evaluate its H14 property, ecotoxic, according to regulations on preparations (French order of 9 November 2004).

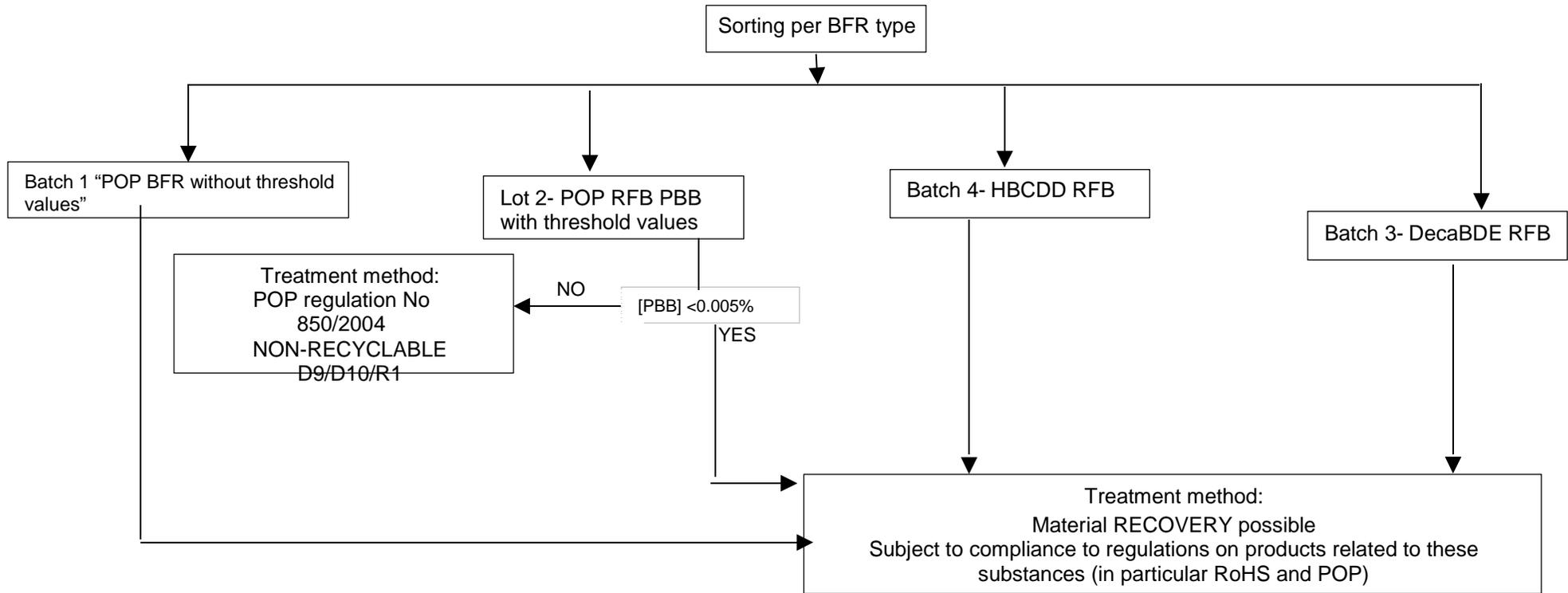
Whether or not the waste is hazardous, material recovery from dismantled WEEE containing HBCDD is possible, subject to compliance of regulations on the manufacture of products and EEE (RoHS Directive).

### **Cross-border shipments**

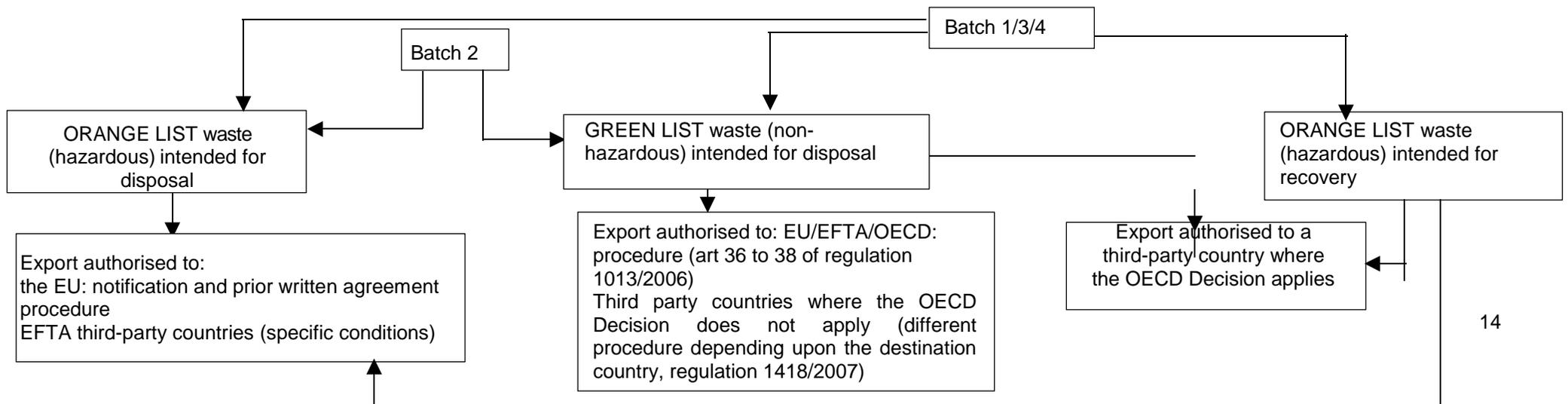
If the waste is non-hazardous and is intended to be recovered, it fulfils green list conditions. The procedures to be followed are identical to the example illustrated in Appendix 3 for the management of batch 2.

If these waste plastics are exported for recovery purposes and if the batch is hazardous or assumed to be hazardous, a notification and prior agreement procedure must be conducted. Exportation is only authorised to an EU member state, to an EFTA country or to countries where the OECD Decision is applied.

### Treatment method



### Exports



### Appendix 5 – List of BFR and hazardous properties

BFE type	Indication of hazard (formerly known as risk phrase)	Associated danger thresholds commission decision of 2000
HexaBB – PBB	Carcinogen category 2 (IARC 1987)	0.1%
PentaBDE TetraBDE	Xn: R48/21/22 R64, Hazardous to aquatic organisms: NR50/53 H400	25% -
HexaBDE HeptaBDE OctaBDE	Toxic to reproduction: Repro.cat 2(R61) Repro cat3 (R62)	0.5% 5%
TBBPA	Dangerous for aquatic organisms: NR50/53 H400	
DecaBDE	Irritant (H319)	20%
HBCDD	Toxic to reproduction: repro cat3 (R62) Irritant: H319/H335/H315 Dangerous for aquatic organisms: NR50/53 H400/H410	5% 20%