COMMISSION REGULATION (EU) No 493/2012

of 11 June 2012

laying down, pursuant to Directive 2006/66/EC of the European Parliament and of the Council, detailed rules regarding the calculation of recycling efficiencies of the recycling processes of waste batteries and accumulators

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC ([1]), and in particular Article 12(6)(a) thereof,

Whereas:

(1) Recycling processes which, as part of a sequence or as standalone processes, recycle waste lead-acid, nickel-cadmium and other batteries and accumulators should achieve the minimum recycling efficiencies set out in Annex III, Part B to Directive 2006/66/EC.

(2) Detailed rules supplementing Annex III, Part B to Directive 2006/66/EC should be laid down for calculating recycling efficiencies.

(3) It is appropriate to define the recycling process as one which starts after collection and possible sorting and/or preparation for recycling of the waste batteries and accumulators received by a recycling facility and finishes when output fractions are produced to be used for their original purpose or for other purposes without undergoing further treatment and have ceased to be waste. In order to encourage the improvement of existing and development of new recycling and treatment technologies, the recycling efficiencies should be achieved by each recycling process.

(4) It is necessary to define the preparation for recycling as a preliminary operation prior to recycling in order to distinguish it from the recycling process of waste batteries and accumulators.

(5) The recycling efficiencies of the recycling processes of waste batteries and accumulators should be calculated by reference to the chemical composition of the input and output fractions and having regard to the latest technical and scientific developments and made publicly available.

(6) It is necessary to harmonise the information to be reported by recyclers in order to monitor compliance with the recycling efficiency requirements across the European Union.

(7) Recyclers of waste batteries and accumulators need at least 18 months to adapt their technological processes to the new recycling efficiencies calculation requirements.

(8) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 39 of Directive 2008/98/EC of the European Parliament and of the Council ([2]),

HAS ADOPTED THIS REGULATION:

Article 1

Scope

This Regulation shall apply to the recycling processes carried out to waste batteries and accumulators from 1 January 2014.

Article 2

Definitions

For the purposes of this Regulation, the following definitions shall apply:

(1) 'recycling process' means any reprocessing operation as referred to in Article 3(8) of Directive 2006/66/EC which is carried out on waste lead-acid, nickel-cadmium and other batteries and accumulators and results in the production of output fractions as defined in point 5 of this Article. The recycling process does not include sorting and/or preparation for recycling/disposal and may be carried out in a single facility or in several facilities;

(2) 'preparation for recycling' means treatment of waste batteries and/or accumulators prior to any recycling process, which shall, inter alia, include storage, handling, dismantling of battery packs or separation of fractions that are not part of the battery or accumulator itself;

(3) 'recycling efficiency' of a recycling process means the ratio obtained by dividing the mass of output fractions accounting for recycling by the mass of the waste batteries and accumulators input fraction expressed as a percentage;

(4) 'input fraction' means the mass of collected waste batteries and accumulators entering the recycling process as defined in Annex I;

([1]) OJ L 266, 26.9.2006, p. 1.

([2]) OJ L 312, 22.11.2008, p. 3.

(5) 'output fraction' means the mass of materials that are produced from the input fraction as a result of the recycling process, as defined in Annex I without undergoing further treatment, that have ceased to be waste or that will be used for their original purpose or for other purposes, but excluding energy recovery.

Article 3

Calculation of recycling efficiency

1. The method set out in Annex I shall be used to calculate the recycling efficiency of a process for recycling waste lead-acid, nickel-cadmium and other batteries and accumulators.

2. The method set out in Annex II shall be used to calculate the rate of recycled lead content for any recycling process.

3. The method set out in Annex III shall be used to calculate the rate of recycled cadmium content for any recycling process.

4. Recyclers shall report the information shown in Annex IV, Annex V and Annex VI, as applicable, on an annual basis and shall send it to the Member State's competent authorities by no later than four months from the end of a calendar year concerned. Recyclers shall send their first annual reports no later than the 30 April 2015.

5. Reporting on the recycling efficiency shall cover all individual steps of recycling and all corresponding output fractions.

6. Where a recycling process is carried out at more than one facility, the first recycler is responsible for submitting the information required under point 4 to the Member State's competent authorities.

Article 4

Entry into force

This Regulation shall enter into force on the day of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 11 June 2012.

For the Commission
The President
José Manuel BARROSO

ANNEX I

Method for the calculation of the recycling efficiency of the recycling process of waste batteries and accumulators

1. The recycling efficiency of a recycling process is calculated as follows:

$$R_E = \frac{\sum m_{output}}{m_{input}} \times 100, \text{ [mass \%]}$$

where:

R_E = calculated *recycling efficiency* of a recycling process for the purpose of Article 12(4) of Directive 2006/66/EC [in mass %];

m_{output} = the *mass of output fractions accounting for recycling per calendar year*;

m_{input} = the *mass of input fractions entering the battery recycling process per calendar year*.

2. The recycling efficiency of a recycling process is calculated separately for the following waste battery types:

— lead-acid batteries and accumulators,

— nickel-cadmium batteries and accumulators, and

— other batteries and accumulators.

3. The recycling efficiency is calculated on the basis of the overall chemical composition (at elemental/compound level) of the input and output fractions. The following applies in respect of the input fraction:

— recyclers shall determine the share of different types of waste battery or accumulator present in an input fraction by conducting a sorting analysis of the fraction (by continuous or representative sampling),

— the chemical composition of each type of waste battery or accumulator present in the input fraction is determined on the basis of the chemical composition of new batteries and accumulators when placed on the market or on the basis of available data of recyclers or on information provided by the battery producers,

— recyclers shall determine the overall chemical composition of the input fraction by applying the chemical composition analysis to the types of batteries or accumulators present in the input fraction.

4. Emissions to the atmosphere are not accounted for the recycling efficiency.

5. The mass of output fractions accounting for recycling is the mass, on a dry weight basis, of the elements or compounds contained in fractions resulting from the recycling of waste batteries and accumulators per calendar year [in tonnes]. The following may be, inter alia, accounted for output fractions:

— the carbon which is actually used as a reducing agent or which is a component of an output fraction of the recycling process, if it results from the input waste batteries and accumulators, on the condition that it is certified by an independent scientific authority and made publicly available. The carbon which is used for energy recovery is not accounted for the recycling efficiency,

— the oxygen, used as an oxidising agent, if it results from the input waste batteries and accumulators and if it is a component of an output fraction of the recycling process. The oxygen coming from the atmosphere is not accounted for the recycling efficiency,

— battery and accumulator materials contained in slag suitable and used for recycling purposes as defined in Article 3(8) of Directive 2006/66/EC other than landfill construction or backfilling operations, provided that this is in line with national requirements.

6. The *mass of input fractions entering the battery recycling process* is the mass of collected waste batteries and accumulators on a dry weight basis entering the recycling process per calendar year [in tonnes], including:

— fluids and acids,

— the mass of external jacket of waste batteries and accumulators,

and excluding:

— the mass of outer casings belonging to battery packs.

ANNEX II

Method for the calculation of the rate of recycled lead content

1. The rate of recycled lead content is calculated as follows:

$$R_{Pb} = \frac{\sum m_{Pb\ output}}{m_{Pb\ input}} \times 100, \text{ [mass \%]}$$

where:

R_{Pb} = calculated *rate of recycled lead* (Pb) from a recycling process for the purpose of Article 12(4) of Directive 2006/66/EC [in mass %];

$m_{Pb\ output}$ = the *mass of Pb in output fractions accounting for recycling* is the share of Pb contained in these fractions which results from the recycling of lead-acid batteries and accumulators per calendar year [in tonnes];

$m_{Pb\ input}$ = the *mass of Pb in the input fraction entering the battery recycling process* is defined as the yearly average Pb content of waste lead-acid batteries and accumulators multiplied by the input mass of lead-acid batteries and accumulators per calendar year [in tonnes].

2. In the output fraction the lead (Pb) contained in slag at the end of the recycling process is not accounted for the rate of recycled lead content.

ANNEX III

Method for the calculation of the rate of recycled cadmium content

1. The rate of recycled cadmium content is calculated as follows:

$$R_{Cd} = \frac{\sum m_{Cd\ output}}{m_{Cd\ input}} \times 100, \text{ [mass \%]}$$

where:

R_{Cd} = calculated *rate of recycled cadmium* (Cd) from a recycling process for the purpose of Article 12(4) of Directive 2006/66/EC [in mass %];

$m_{Cd\ output}$ = the *mass of Cd in output fractions accounting for recycling* is the share of Cd contained in these fractions which results from the recycling of nickel-cadmium batteries and accumulators per calendar year [in tonnes].

$m_{Cd\ input}$ = the *mass of Cd in the input fraction entering the battery recycling process* is defined as the yearly average Cd content of waste nickel-cadmium batteries and accumulators multiplied by the input mass of nickel-cadmium batteries and accumulators per calendar year [in tonnes].

2. In the output fraction the cadmium (Cd) contained in slag at the end of the recycling process is not accounted for the rate of recycled cadmium content.

ANNEX IV

Reporting on recycling efficiencies for lead-acid batteries and accumulators

1. For lead-acid batteries and accumulators input into the recycling process the following information shall be reported:

Recycling efficiency of a battery recycling process (lead-acid batteries)	
Calendar year	
Facility ([1])	
Name	
Street	
City	
Country	
Contact person	
E-mail	
Tel.	
Description of the complete battery recycling process ([2]):	

Input to the complete battery recycling process ([3])					
Description of waste batteries and accumulators	EWC code (optional)	Mass ([4]) t/a	Overall composition of input		m_{input}
			Element or compound	mass %	[t/a]
			Elements or components, which are not part of the input fractions		
			Impurities ([8])		
			Outer casing of battery pack		
			Water (H_2O)		
			Other		
			Elements or components, which are part of the input fractions		
			Lead (Pb)		
			Sulphuric acid (H_2SO_4)		
			Plastics		
			Other		
			m_{input}, total ([5])		
			m_{output}, Pb ([5])		
			m_{output}, total ([5])		
Recycling efficiency (R_E) ([6]): m_{output}/m_{input}			mass %		
Degree of recycled Pb (R_{Pb}) ([7]): $m_{Pb\ output}/m_{Pb\ input}$			mass %		

Notes:

([1]) Facility treating the waste batteries and accumulators after collection, eventual sorting and preparation for recycling.
([2]) Description of the complete battery recycling process, no matter if carried out by one or several facilities (including a description of the individual recycling steps and their output fractions).
([3]) Description of waste batteries and accumulators as received after collection, eventual sorting and preparation for recycling.
([4]) Wet mass of waste batteries and accumulators as received after collection, eventual sorting and preparation for recycling (the mass of separated impurities and outer casing of battery packs as well as the water content as specified in the field 'overall composition' shall be subtracted for the calculation of the recycling efficiency).

(5) Data transferred from Annex IV(2).
(6) Calculated according to the formula for RE based on data reported according to Annex IV(2).
(7) Calculated according to the formula for R_{Pb} based on data reported according to Annex IV(2).
(8) Examples of impurities include plastic, ebonite chips, items/pieces of iron, fibres from electronic scrap, molten aluminium.

2. For the individual steps of the recycling process of lead-acid batteries and accumulators the following information shall be reported:

Process step	**1**
Calendar year	
Facility (1)	
Name	
Street	
City	
Country	
Contact person	
E-mail	
Tel.	
Description of the individual process step:	

Input (waste batteries or waste batteries fractions) (2)

Description of input	EWC code (optional)	Mass
		t/a

Output

(1) *Intermediate fractions* (3)

Description of fraction	EWC code (optional)	Mass (4)	Further treatment	Recipient (5)	Further process step
		t/a		Name	
					1_1
					1_2
					1_3
					1_4
					1_5
					1_6
					1_7
					1_8
					1_9
					1_10

(2) *Final output fractions accounting for recycling* (6)

Element or compound (7)	Fraction (non-waste) containing the element or compound	Concentration of the element or compound in the fraction	Mass of the element or compound, which results from batteries input	Fate of the fraction
		mass %	t/a	

Element or compound (7)	Fraction (non-waste) containing the element or compound	Concentration of the element or compound in the fraction	Mass of the element or compound, which results from batteries input	Fate of the fraction
		mass %	t/a	
		m_{output}, Pb		
		m_{output}, total		

Notes:

(1) Facility carrying out an individual process step.
(2) For step 1 = the same as input into the complete battery recycling process.
For subsequent steps = intermediate fractions from the previous process step.
(3) Intermediate fractions = fractions destined for subsequent step(s) in the recycling process.
(4) Resulting from the batteries input (dry mass).
(5) Facility to which the intermediate fraction is handed over or — if the further process step is carried out internally — the same as 1.
(6) Final output fractions accounting for recycling = that have ceased to be waste and that will be used for their original purpose or for other purposes without undergoing further treatment, but excluding energy recovery. See also examples in Annex I(5).
(7) Elements and compounds if they were component of the batteries input (waste battery). See special provisions and examples in Annex I(5). For lead (Pb) in slag see the provision in Annex II(2). Lead must be entered as 'Pb'.

ANNEX V

Reporting on recycling efficiencies for nickel-cadmium batteries and accumulators

1. For nickel-cadmium batteries and accumulators input into the recycling process the following information shall be reported:

Recycling efficiency of a battery recycling process (nickel-cadmium batteries)	
Calendar year	
Facility ([1])	
Name	
Street	
City	
Country	
Contact person	
E-mail	
Tel.	
Description of the complete battery recycling process ([2]):	

Input into the complete battery recycling process ([3])					
Description of waste batteries and accumulators	EWC code (optional)	Mass ([4]) t/a	Overall composition of input		m_{input}
			Element or compound	mass %	[t/a]
			Elements or components, which are not part of the input fractions		
			Impurities ([8])		
			Outer casing of battery pack		
			Water (H_2O)		
			Other		
			Elements or components, which are part of the input fractions		
			Cadmium (Cd)		
			Nickel (Ni)		
			Iron (Fe)		
			Plastics		
			Electrolyte		
			m_{input}, total ([5])		
			m_{output}, Cd ([5])		
			m_{output}, total ([5])		
Recycling efficiency (R_E) ([6]):	m_{output}/m_{input}		mass %		
Degree of recycled Cd (R_{Cd}) ([7]):	$m_{Cd\ output}/m_{Cd\ input}$		mass %		

Notes:

([1]) Facility reprocessing the waste batteries and accumulators after collection and eventual sorting.
([2]) Description of the complete battery recycling process, no matter if carried out by one or several facilities (including a description of the individual recycling steps and their output fractions).
([3]) Description of waste batteries and accumulators as received after collection and eventual sorting and preparation for recycling.
([4]) Wet mass of waste batteries and accumulators as received after collection and eventual sorting (the mass of separated impurities and outer casing of battery packs as well as the water content as specified in the field 'overall composition' shall be subtracted for the calculation of the recycling efficiency).

(5) Data transferred from Annex V(2).
(6) Calculated according to the formula for RE based on data reported according to Annex V(2).
(7) Calculated according to the formula for R_{Cd} based on data reported according to Annex V(2).
(8) Examples of impurities include plastic, ebonite chips, items/pieces of iron, fibres from electronic scrap, molten aluminium.

2. For the individual steps of the recycling process of nickel-cadmium batteries and accumulators the following information shall be reported:

Process step	**1**
Calendar year	
Facility (1)	
Name	
Street	
City	
Country	
Contact person	
E-mail	
Tel.	
Description of the individual process step:	

Input (waste batteries or waste batteries fractions) (2)

Description of input	EWC code (optional)	Mass
		T/a

Output

(1) *Intermediate fractions* (3)

Description of fraction	EWC code (optional)	Mass (4)	Further treatment	Recipient (5)	Further process step
		t/a		Name	
					1_1
					1_2
					1_3
					1_4
					1_5
					1_6
					1_7
					1_8
					1_9
					1_10

(2) *Final output fractions accounting for recycling* (6)

Element or compound (7)	Fraction (non-waste) containing the element or compound	Concentration of the element or compound in the fraction	Mass of the element or compound, which results from batteries input	Fate of the fraction
		mass %	t/a	

Element or compound (7)	Fraction (non-waste) containing the element or compound	Concentration of the element or compound in the fraction	Mass of the element or compound, which results from batteries input	Fate of the fraction
		mass %	t/a	
		m_{output}, Cd		
		m_{output}, total		

Notes:

(1) Facility carrying out an individual process step.
(2) For step 1 = the same as input into the complete battery recycling process.
For subsequent steps = intermediate fractions from the previous process step.
(3) Intermediate fractions = fractions destined for subsequent step(s) in the recycling process.
(4) Resulting from the batteries input (dry mass).
(5) Facility to which the intermediate fraction is handed over or — if the further process step is carried out internally — the same as 1.
(6) Final output fractions accounting for recycling = that will be used for their original purpose or for other purposes without undergoing further treatment, see also examples in Annex I(5).
(7) Elements and compounds if they were component of the batteries input (waste battery). See special provisions and examples in Annex I(5). For cadmium (Cd) in slag see provisions in Annex III(2). Cadmium must be entered as 'Cd'.

ANNEX VI

Reporting on recycling efficiencies for other batteries and accumulators

1. For other batteries and accumulators input into the recycling process the following information shall be reported:

Recycling efficiency of a battery recycling process (other batteries)	
Calendar year	
Facility ([1])	
Name	
Street	
City	
Country	
Contact person	
E-mail	
Tel.	
Description of the complete battery recycling process ([2]):	

Input into the complete battery recycling process ([3])

Description of waste batteries and accumulators	EWC code (optional)	Mass ([4]) t/a	Overall composition of input		m_{input}
			Element or compound	mass %	[t/a]
			Elements or components, which are not part of the input fractions		
			Impurities ([7])		
			Outer casing of battery pack		
			Water (H_2O)		
			Other		
			Elements or components, which are part of the input fractions		
			Metals (e.g. Fe, Mn, Zn, Ni, Co, Li, Ag, Cu, Al)		
			Mercury (Hg)		
			Carbon		
			Plastics		
			Electrolyte		
			m_{input}, total ([5])		
			m_{output}, total ([5])		

Recycling efficiency (R_E) ([6]): m_{output}/m_{input} mass %

Notes:

([1]) Facility treating the waste batteries and accumulators after collection, eventual sorting and preparation for recycling.
([2]) Description of the complete battery recycling process, no matter if carried out by one or several facilities (including a description of the individual recycling steps and their output fractions).
([3]) Description of waste batteries and accumulators as received after collection, eventual sorting and preparation for recycling.
([4]) Wet mass of waste batteries and accumulators as received after collection, eventual sorting and preparation for recycling (the mass of separated impurities and outer casing of battery packs as well as the water content as specified in the field 'overall composition' shall be subtracted for the calculation of the recycling efficiency).

(5) Data transferred from Annex VI(2).
(6) Calculated according to the formula for R_E based on data reported according to Annex VI(2).
(7) Examples of impurities include plastic, ebonite chips, items/pieces of iron, fibres from electronic scrap, molten aluminium.

2. For the individual steps of the recycling process of other batteries and accumulators the following information shall be reported:

Process step	**1**
Calendar year	
Facility (1)	
Name	
Street	
City	
Country	
Contact person	
E-mail	
Tel.	
Description of the individual process step:	

Input (waste batteries or waste batteries fractions) (2)

Description of input	EWC code (optional)	Mass
		t/a

Output

(1) *Intermediate fractions* (3)

Description of fraction	EWC code (optional)	Mass (4)	Further treatment	Recipient (5)	Further process step
		t/a		Name	
					1_1
					1_2
					1_3
					1_4
					1_5
					1_6
					1_7
					1_8
					1_9
					1_10

(2) *Final output fractions accounting for recycling* (6)

Element or compound (7)	Fraction (non-waste) containing the element or compound	Concentration of the element or compound in the fraction	Mass of the element or compound, which results from batteries input	Fate of the fraction
		mass %	t/a	

Element or compound (7)	Fraction (non-waste) containing the element or compound	Concentration of the element or compound in the fraction	Mass of the element or compound, which results from batteries input	Fate of the fraction
		mass %	t/a	
		m_{output}, total		

Notes:

(1) Facility carrying out an individual process step
(2) For step 1 = the same as input into the complete battery recycling process.
For subsequent steps = intermediate fractions from the previous process step.
(3) Intermediate fractions = fractions destined for subsequent step(s) in the recycling process.
(4) Resulting from the batteries input (dry mass).
(5) Facility to which the intermediate fraction is handed over or — if the further process step is carried out internally — the same as 1.
(6) Final output fractions accounting for recycling = that will be used for their original purpose or for other purposes without undergoing further treatment, see also examples in Annex I(5).
(7) Elements and compounds if they were component of the batteries input (spent battery). See special provisions and examples in Annex I(5).