



2025/606

4.7.2025

COMMISSION DELEGATED REGULATION (EU) 2025/606

of 21 March 2025

**supplementing Regulation (EU) 2023/1542 of the European Parliament and of the Council by
establishing the methodology for calculation and verification of rates for recycling efficiency and
recovery of materials from waste batteries, and the format for the documentation**

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

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

Having regard to Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 concerning batteries and waste batteries, amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC ⁽¹⁾, and in particular Article 71(4) thereof,

Whereas:

- (1) Regulation (EU) 2023/1542 lays out requirements for recyclers to ensure that they reach targets for recycling efficiency and recovery of materials from waste batteries. The Commission is required to draw up the methodology for calculating and verifying rates of recycling efficiency and recovery of materials from waste batteries, and the format for documentation, in line with those requirements. This is necessary to create a harmonised regulatory framework covering the entire life cycle of batteries that are placed on the market in the Union, including the management of waste batteries.
- (2) The methodology should ensure a high quality of recovery of materials for the battery industry. At the same time, it should not distort competition or otherwise impede the smooth functioning of the internal market for secondary raw materials from waste batteries, while promoting research and innovation in that fast-expanding and developing market. It is necessary to consider and build on the methodology established under Directive 2006/66/EC of the European Parliament and of the Council ⁽²⁾ to properly reflect technological developments and changes in battery recycling and recovery processes, extending their scope to cover existing and new battery chemistries.
- (3) The methodology for calculating and verifying rates of recycling efficiency should detail the input and output fractions that can affect achieving the recycling efficiency targets in order to ensure a harmonised calculation of the achieved recycling efficiency.
- (4) The methodology for calculating and verifying rates of recovery of materials should detail the input and output fractions that can affect recovery of materials targets and any further requirements on the quality of the recovered materials in order to ensure a harmonised calculation of the achieved recovery of materials.
- (5) In order to ensure traceability, ensure fair application of the calculation rules and minimise adverse effects on human health or the environment, the format of the documentation regarding substances listed under point (5) and point (6) of Part A of Annex XII of Regulation (EU) 2023/1542 should include detailed requirements on how to document the treatment of substances into an identifiable stream within the battery recycling process.
- (6) The method to be used when filling in documentation for calculating rates of recycling efficiency and recovery of materials from waste batteries should be specified to ensure that data are consistent and uniform.

⁽¹⁾ OJ L 191, 28.7.2023, p. 1, ELI: <http://data.europa.eu/eli/reg/2023/1542/oj>.

⁽²⁾ 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 (OJ L 266, 26.9.2006, p. 1, ELI: <http://data.europa.eu/eli/dir/2006/66/oj>).

- (7) The formats for documentation for rates of recycling efficiency and recovery of materials should be drawn up separately for lead-acid waste batteries, lithium-based batteries, nickel-cadmium batteries and other batteries to ensure that data are relevant and specific to the different battery chemistries.
- (8) In order to ensure consistent and harmonised application, the methodology for verifying rates of recycling efficiency and recovery of materials should set out, as a minimum, what the verification is to cover, and which verification techniques are to be applied,

HAS ADOPTED THIS REGULATION:

Article 1

The methodology for calculation and verification of rates for recycling efficiency and recovery of materials from waste batteries, and the format for the documentation on recycling efficiency and recovery of materials from waste batteries and on the destination and yield of the final output fractions, are laid down in the Annex.

Article 2

This Regulation shall enter into force on the twentieth day following that 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, 21 March 2025.

For the Commission
The President
Ursula VON DER LEYEN

ANNEX

Methodology for calculation and verification of rates for recycling efficiency for lead-acid batteries, lithium-based batteries, nickel-cadmium batteries and other waste batteries and recovery of materials for cobalt, copper, lead, lithium and nickel, and the format for the documentation

1. Definitions

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

- (1) **‘lithium-based battery’** means any battery containing lithium in the active materials the reaction of which generates electrical energy;
- (2) **‘input fraction’** means the mass, on water-free basis, of waste batteries prepared for recycling and entering the waste battery recycling per calendar year, measured in tonnes; input fractions include the mass of waste battery components dismantled during preparation for recycling, including storing, sorting, discharging, depollution and dismantling of waste batteries, whether or not all or only some of those operations are carried out, also where those components enter other recycling than waste battery recycling.

Input fractions for the calculation of recycling efficiency include:

- dry mass of water-based fluids and acids, namely the mass of the solute;
- the mass of waste battery casing;
- cables that are integral part of the battery as made available on the market and necessary to its operation, excluding the cables required to connect the battery to the final equipment;
- any external part included in the battery as made available on the market, such as screens and printed circuit boards;
- waste modules and cells discarded from preparation for re-use or preparation for repurposing operations and sent to recycling;
- battery manufacturing waste, when it comes in the configuration of a waste cell, module or pack.

Input fractions for calculating the rate of recovery of material for cobalt, copper, lithium and nickel include mass of cobalt, copper, lithium and nickel from recycling waste anode and cathode active materials, current collectors and electrolyte salts. Input fractions for calculating the rate of recovery of material for lead include the mass of any component of lead-acid waste batteries;

- (3) **‘intermediate fraction’** means the mass of waste batteries which is neither an input nor an output fraction and is destined for subsequent step(s) in the waste battery recycling, where the subsequent steps have the aim of converting the intermediate fraction into one or more output fractions;
- (4) **‘output fraction’** means the mass of waste batteries obtained from the recycling derived from input fractions and which is converted into materials, substances or products to be used for their original purpose or other purposes but excluding landfill construction, backfilling operations, reprocessing into materials that are to be used as fuels and energy recovery; output fractions include:
 - mass of converted casings and external parts;
 - mass of converted plastics;
 - mass of converted slag, only for the purpose of calculating recycling efficiency. Metals such as lithium contained in the slag are not taken into account in calculating the rate of recovery of materials.

When the generation of output fraction corresponding to the input fraction in calendar year x takes place over two or three calendar years, the output fraction shall be calculated as if it was generated in calendar year x using known efficiencies of the recycling processes taking place in calendar years $x+1$ and $x+2$, as appropriate;

- (5) **'black mass'** means a cathode fraction or a mixture of cathodic and anodic materials generated through (thermo-) mechanical treatment of any input fraction.

The recovery of the metals contained therein requires further processing to be taken into account in calculating the recovery of material. Hence black mass is an intermediate fraction and cannot be considered as output fraction;

- (6) **'impurities'** means non-intended or non-targeted constituents that are detrimental to the recycling and were not intentionally added. Impurities in the input fractions can be the result of missorting. Impurities in the output fractions can be the result of secondary or incomplete reactions during the recycling and are present in the output fractions even if not sought by the recycler.

Impurities present in the input fractions are part of their mass. Impurities resulting from reactions (e.g. chemicals) are not considered to be part of the mass of output fractions;

- (7) **'first recycler'** means where recycling operations are carried out at more than one facility, a recycler who starts the recycling of the modules and/or cells of waste batteries, e.g. by generating black mass. Where all recycling operations are carried out at one facility, the recycler is also the 'first recycler'. A waste management operator who only conducts preparation for recycling, including the storage, handling and dismantling of battery packs or the separation of fractions that are not part of the waste battery itself, cannot be the first recycler.

2. Method for calculating the rate of recycling efficiency for waste batteries in relation to a recycling process

- (1) The rate of recycling efficiency for waste batteries in relation to a recycling process shall be calculated in mass percentage as follows:

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

where:

rRE = rate of recycling efficiency for waste batteries in relation to a recycling process [in mass %];

m_{output} = output fractions taken into account for recycling per calendar year [in tonnes];

m_{input} = input fractions per calendar year [in tonnes].

- (2) The rate of recycling efficiency shall be calculated separately for each input stream of the following waste battery chemistries:

- lead-acid batteries,
- lithium-based batteries,
- nickel-cadmium batteries,
- other batteries.

- (3) The rate of recycling efficiency shall be calculated on the basis of the chemical composition of the input and output fractions. The following applies in respect of the input fractions:

- recyclers shall determine the share of different waste battery chemistries present in an input fraction by conducting a sorting analysis of the fractions by continuous or representative sampling;
- recyclers shall determine the overall chemical composition of the input fraction through at least one of the following, equivalent methods:
 - on the basis of information provided by the battery producers, where that information is available in an electronic record (for instance the battery passport referred to in Article 77 of Regulation (EU) 2023/1542);

- by determining the chemical composition of all the output fractions plus emissions and waste resulting from treatment;
 - by sampling and analysing the input fraction.
- (4) Emissions to air, water and soil, as defined in Directive 2010/75/EU of the European Parliament and of the Council ⁽¹⁾, shall not be taken into account in calculating recycling efficiency.
- (5) Until 31 December 2029, oxygen, carbon from carbon sources at cell level, iron from iron sources at cell level, phosphorus, chlorine, and sulphur may be taken into account in calculating recycling efficiency, in m_{input} and in m_{output} .
- (6) From 1 January 2030, carbon from carbon sources at cell level, iron from iron sources at cell level, and phosphorus shall be taken into account in calculating recycling efficiency, in m_{input} and in m_{output} , while oxygen, chlorine, and sulphur may be taken into account in calculating recycling efficiency, in m_{input} and in m_{output} .

3. Method for calculating the rates of recovery of materials (cobalt, copper, lithium, nickel and lead) from the recycling of waste batteries

- (1) The rate of recovery of materials is calculated as follows:

$$\text{rRM (TM)} = \frac{\sum m_{\text{TM, output-point}}}{m_{\text{TM, input}}} \times 100, [\text{mass \%}]$$

where:

TM =	any of the target materials listed in in Part C of Annex XII to Regulation (EU) 2023/1542;
rRM =	calculated rate of recovery of materials from waste batteries in relation to recycling [in mass %];
$m_{\text{TM, output-point}}$ =	the mass of the target material in output fractions taken into account in the rate of recovery of materials, namely the mass of TM contained in the output fractions at the RM calculation-point per calendar year [in tonnes];
$m_{\text{TM, input}}$ =	the mass of the target material in the input fraction, namely the mass of TM contained in the input fractions per calendar year [in tonnes].

- (2) 'The calculation point for the recovery of material (**RM calculation point**)' means the step in the waste battery recycling at which the target materials listed in Part C of Annex XII to Regulation (EU) 2023/1542 are recovered as materials, substances or products that can substitute primary materials, substances or products in industrial processes of manufacturing. Output fractions at the RM calculation-point shall be the only output fractions to be taken into account in calculating the rate of recovery of materials.
- (3) The recovered material shall have a TM content as high as technically feasible while avoiding excessive costs.

4. Format of documentation on the treatment of substances listed under point (5) and point (6) of Part A of Annex XII of Regulation (EU) 2023/1542

- (1) The streams of substances listed under point (5) and point (6) of Part A of Annex XII to Regulation (EU) 2023/1542 resulting from the recycling of waste batteries and containing mercury and cadmium, shall be explicitly stated in the documentation in accordance with sections 6 to 9.

⁽¹⁾ Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (OJ L 334, 17.12.2010, p. 17, ELI: <http://data.europa.eu/eli/dir/2010/75/oj>).

- (2) The total amount of cadmium which is given a safe destination in accordance with point 6 of Part A of Annex XII to Regulation (EU) 2023/1542 shall be indicated as follows in the documentation in accordance with section 8 of this Annex:

$m_{\text{Cd, input}}$ =	the mass of Cd in the input fraction, namely the yearly average Cd content of waste nickel-cadmium batteries, multiplied by the input mass of those batteries or fractions per calendar year [in tonnes].
$m_{\text{Cd, output}}$ =	the mass of Cd in output fractions taken into account for recycling, namely the share of Cd contained in those fractions which result from the recycling of nickel-cadmium batteries per calendar year [in tonnes].
$m_{\text{Cd, waste}}$ =	the mass of Cd in the waste fractions safely immobilised and disposed of at the exit of the waste battery recycling [in tonnes].

- (3) The total amount of mercury which is safely immobilised and disposed of in accordance with point 5 of Part A of Annex XII to Regulation (EU) 2023/1542 shall be indicated as follows in the documentation in accordance with sections 6 to 9 of this Annex:

$m_{\text{Hg, input}}$ =	the mass of Hg in the input fraction, namely the yearly average Hg content of waste batteries multiplied by the input mass of mercury batteries per calendar year [in tonnes].
$m_{\text{Hg, waste}}$ =	the mass of Hg safely immobilised and disposed as waste at the exit of the waste battery recycling [in tonnes].

5. Method of filling in documentation for calculating recycling efficiency and recovery of materials from waste batteries

- (1) Recyclers shall provide the data and information set out in sections 2, 3 and 4 every year, broken down by Member State in which the waste batteries were collected. They shall send it to the competent authorities of the Member States in which the waste batteries were treated. Those authorities shall give the information set out in this section to the competent authorities of the Member States in which the waste batteries were collected, if different. The data and information provided in accordance with this section may also be considered for the purposes of complying with the requirements of Article 75(5) of Regulation (EU) 2023/1542, which requires the annual provision information commencing for the calendar year 2026.
- (2) Data and information on the rates of recycling efficiency and recovery of materials shall cover all individual steps of the waste battery recycling, i.e. all recycling facilities involved, but not the individual recycling operations carried out within one facility, and all corresponding output fractions.
- (3) Where waste battery recycling is carried out at more than one permitted facility, the first recycler shall be responsible for collecting and providing the information required under points 1 and 2 to the competent authorities of the Member State. Waste management operators who are upstream from the first recycler, e.g. conducting preparation for recycling, including the storage, handling, and dismantling of battery packs or the separation of fractions that are not part of the waste battery itself, shall provide the necessary information and data to the first recycler.
- (4) Where waste holders other than waste management operators carrying out treatment and recyclers export waste batteries for treatment, they shall provide to the competent authorities of the Member States in which they are located data on the amount of separately collected waste batteries exported for treatment and the data on:
 - the quantity of waste batteries that began to undergo preparation for re-use, preparation for repurposing or recycling;
 - recycling efficiency for waste batteries, recovery of materials from waste batteries and the destination and yield of the final output fractions.
- (5) For the purposes of point 1 and point 2 of this section, the following data and information shall be provided using the documentation format set out in sections 6 to 9:
 - full name, possible abbreviations and geographical location, including Member State(s) in which the recycling took place, of the first recycler;
 - the calendar year for which the documentation is provided;

- battery chemistry (lead-acid, lithium-based, nickel-cadmium, others) treated and, for lithium-based batteries, also the main treated chemistry;
- a flow-chart for each treatment included in the documentation, from preparation for recycling to output fractions taken into account for the recovery of material or for safe destination, in accordance with sections 1 to 4;
- a detailed list of input, intermediate and output fractions;
- the rate of recycling efficiency and recovery of materials for each treatment carried out on each battery chemistry (lead-acid, lithium-based, nickel-cadmium, others) accepted at the recycling facility;
- the amount of cadmium recycled or disposed of and the amount of mercury safely immobilised and disposed of, in accordance with section 4.

6. Format of documentation for the rate of recycling efficiency and recovery of materials from lead-acid waste batteries

Part 1. For recycling of lead-acid waste batteries, the following shall be documented:

Rates of recycling efficiency and recovery of materials of lead-acid waste battery recycling

Calendar year

Facility ⁽¹⁾	Name		Postal code:
	Street		
	City		
	Country		
	Contact person		
	Tel.		
	Email		

Description of the complete battery recycling ⁽²⁾:

Insert in this cell a flow-chart and/or a description of the recycling steps

Entering the complete waste battery recycling ⁽³⁾					
Type of waste batteries	EWC code	Mass ⁽⁴⁾ : [t/a]	Member State in which the waste batteries were collected ⁽⁹⁾		

RESULTS – calculated by first recycler – generated from waste batteries collected in the Member State, in which the recycler is located					Name of the Member State:		
Element or compound	Input fraction $m_{\text{input}}^{(3)}$ [t/a]	Output fraction $^{(3)}$ generated in EU Member States [t/a]	Output fraction $^{(5)}$ generated outside the EU [t/a] $^{(8)}$	Total output fraction $m_{\text{output}}^{(3)}$ [t/a]	rRE $^{(10)}$ [mass %]	rRM $^{(11)}$ [mass %]	$m_{\text{Hg,waste}}$ total Mercury (Hg) $^{(13)}$ safely immobilised and disposed [t/a]
Total lead (Pb)							
Dry sulphuric acid (H ₂ SO ₄)							
Plastics $^{(6)}$							
Steel							
Other(please specify) $^{(7)}$							
Total							
RESULTS – calculated by first recycler – generated from waste batteries collected in another Member State $^{(9)}$:					Name of the Member State:		
Element or compound	Input fraction $m_{\text{input}}^{(3)}$ [t/a]	Output fraction $^{(3)}$ generated in EU Member States [t/a]	Output fraction $^{(5)}$ generated outside the EU [t/a] $^{(8)}$	Total output fraction $m_{\text{output}}^{(3)}$ [t/a]	rRE $^{(10)}$ [mass %]	rRM $^{(11)}$ [mass %]	$m_{\text{Hg,waste}}$ total Mercury (Hg) $^{(13)}$ safely immobilised and disposed [t/a]
Total lead (Pb)							
Dry sulphuric acid (H ₂ SO ₄)							
Plastics $^{(6)}$							
Steel							
Other (please specify) $^{(7)}$							
Total							

VERIFICATION – filled-in by the competent authority (authorities)				
Verification techniques ⁽¹²⁾	☐	verification of overall calculations	☐	auditing by competent authority (including visits to sites)
	☐	verification of the provision of documentary evidence	☐	self-auditing by external companies

Notes

- ⁽¹⁾ Facility treating the waste batteries after collection, possible sorting and preparation for recycling.
- ⁽²⁾ Flowchart or description of the complete recycling, even if carried out at more than one facility, highlighting which are the operations carried out at the first recycler and which are the operations (if any) carried out outside the Union and the related output fractions.
- ⁽³⁾ Description of waste batteries as received after collection, possible sorting and preparation for recycling.
- ⁽⁴⁾ Wet mass of waste batteries as received after collection, possible sorting and preparation for recycling.
- ⁽⁵⁾ For definitions of ‘input’ and ‘output’ fractions and in particular which fractions are accountable for RE and/or RM calculation, see section 1, points 2 and 4.
- ⁽⁶⁾ Plastics that are recycled and for which the m_{input} as well as the m_{output} are measured, are indicated in the list separately from carbon at cell level.
- ⁽⁷⁾ Add other cells if necessary to specify other elements or compounds. In case the element has a target for recovery of materials in Part C of Annex XII of Regulation (EU) 2023/1542, provide also the achieved recovery rate r_{RM} . In case waste batteries contain Mercury (Hg), see section 4 for documentation of Mercury (Hg) and provide the total amount of Mercury in the input ($m_{\text{Hg} \cdot \text{input}}$) and the amount of safely immobilised and disposed Mercury ($m_{\text{Hg} \cdot \text{waste}}$).
- ⁽⁸⁾ Provide documentary evidence in accordance with Art 72, paragraph 3 of Regulation (EU) 2023/1542, together with this data documentation.
- ⁽⁹⁾ In case waste batteries stemming from more than one other Member State are recycled, please duplicate the cells and fill in appropriately.
- ⁽¹⁰⁾ Calculated in accordance with the formula of r_{RE} in section 2 and in accordance with data from part (2) of this template on individual steps of the (related) waste battery recycling.

- (¹¹) Calculated in accordance with the formula for rRM(TM) in section 3 and in accordance with data from part (2) of this template on individual steps of the (related) waste battery recycling.
- (¹²) Indicate the number of verifications executed per technique. For verification of overall calculations, the number shall be 1 reflecting the mandatory verification of calculations submitted by the first recycler. For the other verification techniques, the number can vary from 0 – if none of these were carried out – to 1 – if these other techniques were carried out only on first recycler – up to the total number of actors in the recycling chain – if they were carried out on all the actors of the recycling chain as indicated in part (2) of this template.
- (¹³) For documentation of Mercury (Hg), only for Hg-containing batteries, see section 4. Competent authorities shall verify that the total amount of safely immobilised and disposed Mercury ($m_{\text{Hg,waste}}$) corresponds to the total amount of Mercury in the input ($m_{\text{Hg,input}}$).

Part 2. Individual steps of recycling, i.e. all recycling facilities involved, shall be documented:

Recycling step (¹)

N_0

Calendar year

Facility (¹)

Name

Street

City

Country

Contact person

Tel.

Email

Postal code:

Description of the individual recycling step(s):

Insert in this cell a flow-chart and/or a description of the individual recycling step

(1) Entering the recycling step(s) (waste batteries or their fraction) (²):

Type of input	EWG code	Mass (³): [t/a]	Member State in which the waste batteries were collected (¹²)	

Recycling

(2) Intermediate fractions ⁽⁴⁾

Type of input	EWC code	Mass: [t/a]	Further treatment	Further operator ⁽⁵⁾	Further recycling step
					N_1
					N_2
					N_3
					N_4
					N_5

(3) Input and output fractions that account for rRE and rRM calculations ⁽⁶⁾ generated from waste batteries collected in the Member State, in which the recycler is located

			Name of the Member State:				
Element or compound, targeted or non targeted ⁽⁷⁾	Input fraction m _{input} [t/a]	Output fraction generated in EU Member States [t/a]	Output fraction ⁽⁸⁾ generated outside the EU [t/a]	Total output fraction generated m _{output} [t/a]	Non-waste fraction containing the element or compound	Destination and yield of the fraction	m _{Hg,waste} total Mercury (Hg) ⁽¹³⁾ safely immobilised and disposed [t/a]
Total lead (Pb)							
Dry sulphuric acid (H ₂ SO ₄)							
Plastics ⁽⁹⁾							
Steel							
Other (please specify) ⁽¹⁰⁾							
m _{input} and m _{output} ⁽¹¹⁾ [t/a] from this step							

(4) Input and output fractions that account for rRE and rRM calculations ⁽⁶⁾ generated from waste batteries collected in another Member State ⁽¹²⁾					Name of the Member State:		
Element or compound, targeted or non targeted ⁽⁷⁾	Input fraction m_{input} [t/a]	Output fraction generated in EU Member States [t/a]	Output fraction ⁽⁸⁾ generated outside the EU [t/a]	Total output fraction generated m_{output} [t/a]	Non-waste fraction containing the element or compound	Destination and yield of the fraction	m_{Hgwaste} total Mercury (Hg) ⁽¹³⁾ safely immobilised and disposed [t/a]
Total lead (Pb)							
Dry sulphuric acid (H ₂ SO ₄)							
Plastics ⁽⁹⁾							
Steel							
Other (please specify) ⁽¹⁰⁾							
m_{input} and m_{output} ⁽¹¹⁾ [t/a] from this step							

Notes

- ⁽¹⁾ Facility carrying out an individual recycling step. For further recycling steps at different facilities, e.g. N_1, N_2, please copy this entire part 2 and fill in appropriately.
- ⁽²⁾ For step 1 = the same as input into the complete waste battery recycling in part (1) of the template. For subsequent steps = intermediate fractions coming from the previous step.
- ⁽³⁾ Mass of intermediate fraction entering the individual recycling step. For step 1 = the same as input into the complete waste battery recycling in part (1).
- ⁽⁴⁾ For the definition of ‘intermediate fraction’, see section 1, point 3. For black mass, see section 1, point 5 and ensure that the chemistry of the waste battery, or the main chemistry in mass% in case of mixtures, is indicated next to the term ‘black mass’, e.g. ‘black mass-ZnC’ or ‘black mass-NMC’.
- ⁽⁵⁾ Facility where the intermediate fraction is treated, including name, street, city, postal code, country, contact person, telephone, email. If the further process step is carried out at the same facility as the preceding step, insert ‘same as preceding’.

- (⁶) For definitions of ‘input’ and ‘output’ fractions and in particular which fractions are accountable for RE and/or RM calculation, see section 1, points 2 and 4.
- (⁷) Elements and compound recovered from the input waste battery. For definitions of ‘input’ and ‘output’ fractions and in particular which fractions are accountable for RE and/or RM calculation, see section 1, points 2 and 4.
- (⁸) Provide documentary evidence in accordance with Art 72, paragraph 3 of Regulation (EU) 2023/1542, together with this data documentation.
- (⁹) Plastics that are recycled and for which the m_{input} as well as the m_{output} are measured, are indicated in the list separately from carbon at cell level.
- (¹⁰) Add other cells if necessary to specify other elements or compounds. In case waste batteries contain Mercury (Hg), see section 4 for documentation of Mercury (Hg) and provide the total amount of Mercury in the input ($m_{\text{Hg,input}}$) and the amount of safely immobilised and disposed Mercury ($m_{\text{Hg,waste}}$).
- (¹¹) The sum of m_{input} and m_{output} from all steps, e.g. N_0, N_1, N_2 etc., shall equal the total m_{input} and m_{output} .
- (¹²) In case batteries stemming from more than one other Member State are recycled, please duplicate the cells and fill in appropriately.
- (¹³) For documentation of Mercury (Hg), only for Hg-containing batteries, see section 4. Competent authorities shall verify that the total amount of safely immobilised and disposed Mercury ($m_{\text{Hg,waste}}$) corresponds to the total amount of Mercury in the input ($m_{\text{Hg,input}}$).

7. Format of documentation for the rate of recycling efficiency and recovery of materials from lithium-based waste batteries

Part 1: For recycling of lithium-based waste batteries, the following shall be documented:

Rates of recycling efficiency and recovery of materials of lithium-based waste battery recycling

Calendar year

Facility (¹)

Name	
Street	
City	
Country	
Contact person	
Tel.	
Email	

Postal code:

Description of the complete battery recycling (²):

Insert in this cell a flow-chart and/or a description of the recycling steps

Entering the complete waste battery recycling ⁽³⁾							
Type of waste batteries		EWC code		Mass ⁽⁴⁾ : [t/a]		Member State in which the waste batteries were collected ⁽⁹⁾	
RESULTS – calculated by first recycler – generated from waste batteries collected in the Member State, in which the recycler is located						Name of the Member State:	
Element or compound	Input fraction m _{input} ⁽⁵⁾ [t/a]	Output fraction ⁽⁵⁾ generated in EU Member States [t/a]	Output fraction ⁽⁵⁾ generated outside the EU [t/a] ⁽⁹⁾	Total output fraction m _{output} ⁽⁵⁾ [t/a]	rRE ⁽¹⁰⁾ [mass %]	rRM ⁽¹¹⁾ [mass %]	m _{Hg,waste} total Mercury (Hg) ⁽¹⁴⁾ safely immobilised and disposed [t/a]
Cobalt (Co)							
Copper (Cu)							
Lithium (Li)							
Nickel (Ni)							
Manganese (Mn)							
Aluminium (Al)							
Steel							
Plastics ⁽⁶⁾							
Oxygen (O ₂) ⁽⁷⁾							
Carbon from carbon sources at cell level (C) ⁽⁷⁾							
Iron from iron sources at cell level (Fe) ⁽⁷⁾							

Phosphorus (P) ⁽⁷⁾							
Chlorine (Cl) ⁽⁷⁾							
Sulphur (S) ⁽⁷⁾							
Other (please specify) ⁽⁸⁾							
Total							
RESULTS – calculated by first recycler – generated from waste batteries collected in another Member State ⁽¹⁰⁾ :					Name of the Member State:		
Element or compound	Input fraction m _{input} ⁽⁵⁾ [t/a]	Output fraction ⁽⁵⁾ generated in EU Member States [t/a]	Output fraction ⁽⁵⁾ generated outside the EU [t/a] ⁽⁹⁾	Total output fraction m _{output} ⁽⁵⁾ [t/a]	rRE ⁽¹¹⁾ [mass %]	rRM ⁽¹²⁾ [mass %]	m _{Hg,waste} total Mercury (Hg) ⁽¹⁴⁾ safely immobilised and disposed [t/a]
Cobalt (Co)							
Copper (Cu)							
Lithium (Li)							
Nickel (Ni)							
Manganese (Mn)							
Aluminium (Al)							
Steel							
Plastics ⁽⁶⁾							
Oxygen (O ₂) ⁽⁷⁾							
Carbon from carbon sources at cell level (C) ⁽⁷⁾							
Iron from iron sources at cell level (Fe) ⁽⁷⁾							
Phosphorus (P) ⁽⁷⁾							
Chlorine (Cl) ⁽⁷⁾							
Sulphur (S) ⁽⁷⁾							
Other (please specify) ⁽⁸⁾							

Total							
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VERIFICATION – filled-in by the competent authority (authorities)

Verification techniques ⁽¹⁾	☐	verification of overall calculations	☐	auditing by competent authority (including visits to sites)
	☐	verification of the provision of documentary evidence	☐	self-auditing by external companies

Notes

- (¹) Facility treating the waste batteries after collection, possible sorting and preparation for recycling.
- (²) Flowchart or description of the complete recycling, even if carried out at more than one facility, highlighting which are the operations carried out at the first recycler and which are the operations (if any) carried out outside the Union and the related output fractions.
- (³) Description of waste batteries as received after collection, possible sorting and preparation for recycling.
- (⁴) Wet mass of waste batteries as received after collection, possible sorting and preparation for recycling.
- (⁵) For definitions of ‘input’ and ‘output’ fractions and in particular which fractions are accountable for RE and/or RM calculation, see section 1, points 2 and 4.
- (⁶) Plastics that are recycled and for which the m_{input} as well as the m_{output} are measured, are indicated in the list separately from carbon at cell level.
- (⁷) If not taken into account in calculating recycling efficiency in accordance with section 2, point 5 and point 6 of this Annex, leave empty.
- (⁸) Add other cells if necessary to specify other elements or compounds. In case the element has a target for recovery of materials in Part C of Annex XII of Regulation (EU) 2023/1542, provide also the achieved recovery rate r_{RM} . In case waste batteries contain Mercury (Hg), see section 4 for documentation of Mercury (Hg) and provide the total amount of Mercury in the input ($m_{\text{Hg,input}}$) and the amount of safely immobilised and disposed Mercury ($m_{\text{Hg,waste}}$).
- (⁹) Provide documentary evidence in accordance with Art 72, paragraph 3 of Regulation (EU) 2023/1542, together with this data documentation.
- (¹⁰) In case waste batteries stemming from more than one other Member State are recycled, please duplicate the cells and fill in appropriately.
- (¹¹) Calculated in accordance with the formula of r_{RE} in section 2 and in accordance with data from part (2) of this template on individual steps of the (related) waste battery recycling.

- ⁽¹²⁾ Calculated in accordance with the formula for rRM(TM) in section 3 and in accordance with data from part (2) of this template on individual steps of the (related) waste battery recycling.
- ⁽¹³⁾ Indicate the number of verifications executed per technique. For verification of overall calculations, the number shall be 1 reflecting the mandatory verification of calculations submitted by the first recycler. For the other verification techniques, the number can vary from 0 – if none of these were carried out – to 1 – if these other techniques were carried out only on first recycler – up to the total number of actors in the recycling chain – if they were carried out on all the actors of the recycling chain as indicated in part (2) of this template.
- ⁽¹⁴⁾ For documentation of Mercury (Hg), only for Hg-containing batteries, see section 4. Competent authorities shall verify that the total amount of safely immobilised and disposed Mercury ($m_{\text{Hg,waste}}$) corresponds to the total amount of Mercury in the input ($m_{\text{Hg,input}}$).

Part 2: Individual steps of recycling, i.e. all recycling facilities involved, shall be documented:

Recycling step ⁽¹⁾	N_0

Calendar year

Facility ⁽¹⁾	Name	
	Street	
	City	
	Country	
	Contact person	
	Tel.	
	Email	

Postal code:

Description of the individual recycling step(s):

Insert in this cell a flow-chart and/or a description of the individual recycling step

(1) Entering the recycling step(s) (waste batteries or their fraction) ⁽²⁾:

Type of input	EWG code	Mass ⁽³⁾ : [t/a]	Member State in which the waste batteries were collected ⁽¹²⁾	

Recycling

(2) Intermediate fractions ⁽⁴⁾

Type of input	EWC code	Mass: [t/a]	Further treatment	Further operator ⁽⁵⁾	Further recycling step
					N_1
					N_2
					N_3
					N_4
					N_5

(3) Input and output fractions that account for rRE and rRM calculations ⁽⁶⁾ generated from waste batteries collected in the Member State, in which the recycler is located						Name of the Member State:	m _{Hg,waste} total Mercury (Hg) ⁽¹⁴⁾ safely immobilised and disposed [t/a]
Element or compound, targeted or non targeted ⁽⁷⁾	Input fraction m _{input} [t/a]	Output fraction generated in EU Member States [t/a]	Output fraction ⁽⁸⁾ generated outside the EU [t/a]	Total output fraction generated m _{output} [t/a]	Non-waste fraction containing the element or compound	Destination and yield of the fraction	
Cobalt (Co)							
Copper (Cu)							
Lithium (Li)							
Nickel (Ni)							
Manganese (Mn)							
Aluminium (Al)							
Steel							
Plastics ⁽⁹⁾							

Oxygen (O ₂) ⁽¹⁰⁾							
Carbon from carbon sources at cell level (C) ⁽¹⁰⁾							
Iron from iron sources at cell level (Fe) ⁽¹⁰⁾							
Phosphorus (P) ⁽¹⁰⁾							
Chlorine (Cl) ⁽¹⁰⁾							
Sulphur (S) ⁽¹⁰⁾							
Other (please specify) ⁽¹¹⁾							
m _{input} and m _{output} ⁽¹²⁾ [t/a] from this step							

(4) Input and output fractions that account for rRE and rRM calculations ⁽⁶⁾ generated from waste batteries collected in another Member State ⁽¹³⁾						Name of the Member State:	
Element or compound, targeted or non targeted ⁽⁷⁾	Input fraction m _{input} [t/a]	Output fraction generated in EU Member States [t/a]	Output fraction ⁽⁸⁾ generated outside the EU [t/a]	Total output fraction generated m _{output} [t/a]	Non-waste fraction containing the element or compound	Destination and yield of the fraction	m _{Hg,waste} total Mercury (Hg) ⁽¹⁴⁾ safely immobilised and disposed [t/a]
Cobalt (Co)							
Copper (Cu)							
Lithium (Li)							
Nickel (Ni)							
Manganese (Mn)							
Aluminium (Al)							
Steel							
Plastics ⁽⁹⁾							

Oxygen (O ₂) ⁽¹⁰⁾							
Carbon from carbon sources at cell level (C) ⁽¹⁰⁾							
Iron from iron sources at cell level (Fe) ⁽¹⁰⁾							
Phosphorus (P) ⁽¹⁰⁾							
Chlorine (Cl) ⁽¹⁰⁾							
Sulphur (S) ⁽¹⁰⁾							
Other (please specify) ⁽¹¹⁾							
m _{input} and m _{output} ⁽¹²⁾ [t/a] from this step							

Notes

- ⁽¹⁾ Facility carrying out an individual recycling step. For further recycling steps at different facilities, e.g. N_1, N_2, please copy this entire part 2 and fill in appropriately.
- ⁽²⁾ For step 1 = the same as input into the complete waste battery recycling in part (1) of the template. For subsequent steps = intermediate fractions coming from the previous step.
- ⁽³⁾ Mass of intermediate fraction entering the individual recycling step. For step 1 = the same as input into the complete waste battery recycling in part (1).
- ⁽⁴⁾ For the definition of ‘intermediate fraction’, see section 1, point 3. For black mass, see section 1, point 5 and ensure that the chemistry of the waste battery, or the main chemistry in mass% in case of mixtures, is indicated next to the term ‘black mass’, e.g. ‘black mass-ZnC’ or ‘black mass-NMC’.
- ⁽⁵⁾ Facility where the intermediate fraction is treated, including name, street, city, postal code, country, contact person, telephone, email. If the further process step is carried out at the same facility as the preceding step, insert ‘same as preceding’.
- ⁽⁶⁾ For definitions of ‘input’ and ‘output’ fractions and in particular which fractions are accountable for RE and/or RM calculation, see section 1, points 2 and 4.
- ⁽⁷⁾ Elements and compounds recovered from the input waste battery. For definitions of ‘input’ and ‘output’ fractions and in particular which fractions are accountable for RE and/or RM calculation, see section 1, points 2 and 4.

- ⁽⁸⁾ Provide documentary evidence in accordance with Art 72, paragraph 3 of Regulation (EU) 2023/1542, together with this data documentation.
- ⁽⁹⁾ Plastics that are recycled and for which the m_{input} as well as the m_{output} are measured, are indicated in the list separately from carbon at cell level.
- ⁽¹⁰⁾ If not taken into account in calculating recycling efficiency in accordance with section 2, point 5 and point 6 of this Annex, leave empty.
- ⁽¹¹⁾ Add other cells if necessary to specify other elements or compounds. In case waste batteries contain Mercury (Hg), see section 4 for documentation of Mercury (Hg) and provide the total amount of Mercury in the input ($m_{Hg,input}$) and the amount of safely immobilised and disposed Mercury ($m_{Hg,waste}$).
- ⁽¹²⁾ The sum of m_{input} and m_{output} from all steps, e.g. N_0, N_1, N_2 etc., shall equal the total m_{input} and m_{output}
- ⁽¹³⁾ In case batteries stemming from more than one other Member State are recycled, please duplicate the cells and fill in appropriately.
- ⁽¹⁴⁾ For documentation of Mercury (Hg), only for Hg-containing batteries, see section 4. Competent authorities shall verify that the total amount of safely immobilised and disposed Mercury ($m_{Hg,waste}$) corresponds to the total amount of Mercury in the input ($m_{Hg,input}$).

8. Format of documentation for the rate of recycling efficiency and recovery of materials from nickel-cadmium waste batteries

Part 1: For recycling of nickel-cadmium waste batteries, the following shall be documented:

Rates of recycling efficiency and recovery of materials of nickel-cadmium (NiCd) waste battery recycling

Calendar year

Facility ⁽¹⁾	Name	
	Street	
	City	
	Country	
	Contact person	
	Tel.	
	Email	

Postal code:

Description of the complete battery recycling ⁽²⁾:

Insert in this cell a flow-chart and/or a description of the recycling steps

Entering the complete waste battery recycling ⁽³⁾

Type of waste batteries		EWC code	Mass ⁽⁴⁾ : [t/a]	Member State in which the waste batteries were collected ⁽⁹⁾	

RESULTS – calculated by first recycler – generated from waste batteries collected in the Member State, in which the recycler is located					Name of the Member State:		
Element or compound	Input fraction m _{input} ⁽⁵⁾ [t/a]	Output fraction ⁽⁵⁾ generated in EU Member States [t/a]	Output fraction ⁽⁵⁾ generated outside the EU [t/a] ⁽⁸⁾	Total output fraction m _{output} ⁽⁵⁾ [t/a]	rRE ⁽¹⁰⁾ [mass %]	rRM ⁽¹¹⁾ [mass %]	m _{Cd, waste} total Cadmium (Cd) ⁽¹²⁾ or m _{Hg, waste} total Mercury (Hg) ⁽¹²⁾ safely immobilised and disposed [t/a]
Cobalt (Co)							
Copper (Cu)							
Lead (Pb)							
Lithium (Li)							
Nickel (Ni)							
Manganese (Mn)							
Aluminium (Al)							
Steel							
Electrolyte (KOH)							

Electrolyte (NaOH)							
Plastics ⁽⁶⁾							
Cadmium (Cd) ⁽¹²⁾							
Other (please specify) ⁽⁷⁾							
Total							

RESULTS – calculated by first recycler – generated from waste batteries collected in another Member State ⁽⁹⁾ :					Name of the Member State:		
Element or compound	Input fraction m _{input} ⁽⁵⁾ [t/a]	Output fraction ⁽⁵⁾ generated in EU Member States [t/a]	Output fraction ⁽⁵⁾ generated outside the EU [t/a] ⁽⁸⁾	Total output fraction m _{output} ⁽⁵⁾ [t/a]	rRE ⁽¹⁰⁾ [mass %]	rRM ⁽¹¹⁾ [mass %]	m _{Cd, waste total} Cadmium (Cd) ⁽¹²⁾ or m _{Hg,waste total} Mercury (Hg) ⁽¹²⁾ safely immobilised and disposed [t/a]
Cobalt (Co)							
Copper (Cu)							
Lead (Pb)							
Lithium (Li)							
Nickel (Ni)							
Manganese (Mn)							
Aluminium (Al)							
Steel							

Electrolyte (KOH)							
Electrolyte (NaOH)							
Plastics ⁽⁶⁾							
Cadmium (Cd) ⁽¹²⁾							
Other (please specify) ⁽⁷⁾							
Total							

VERIFICATION – filled-in by the competent authority (authorities)

Verification techniques ⁽¹³⁾

☐

verification of overall calculations

☐

auditing by competent authority (including visits to sites)

☐

verification of the provision of documentary evidence

☐

self-auditing by external companies

Notes

⁽¹⁾ Facility treating the waste batteries after collection, possible sorting and preparation for recycling.

⁽²⁾ Flowchart or description of the complete recycling, even if carried out at more than one facility, highlighting which are the operations carried out at the first recycler and which are the operations (if any) carried out outside the Union and the related output fractions.

⁽³⁾ Description of waste batteries as received after collection, possible sorting and preparation for recycling.

⁽⁴⁾ Wet mass of waste batteries as received after collection, possible sorting and preparation for recycling.

- (⁵) For definitions of 'input' and 'output' fractions and in particular which fractions are accountable for RE and/or RM calculation, see section 1, points 2 and 4.
- (⁶) Plastics that are recycled and for which the m_{input} as well as the m_{output} are measured, are indicated in the list separately from carbon at cell level.
- (⁷) Add other cells if necessary to specify other elements or compounds. In case the element has a target for recovery of materials in Part C of Annex XII of Regulation (EU) 2023/1542, provide also the achieved recovery rate r_{RM} . In case waste batteries contain Mercury (Hg), see section 4 for documentation of Mercury (Hg) and provide the total amount of Mercury in the input ($m_{\text{Hg,input}}$) and the amount of safely immobilised and disposed Mercury ($m_{\text{Hg,waste}}$).
- (⁸) Provide documentary evidence in accordance with Art 72, paragraph 3 of Regulation (EU) 2023/1542, together with this data documentation.
- (⁹) In case waste batteries stemming from more than one other Member State are recycled, please duplicate the cells and fill in appropriately.
- (¹⁰) Calculated in accordance with the formula of r_{RE} in section 2 and in accordance with data from part (2) of this template on individual steps of the (related) waste battery recycling.
- (¹¹) Calculated in accordance with the formula for $r_{\text{RM(TM)}}$ in section 3 and in accordance with data from part (2) of this template on individual steps of the (related) waste battery recycling.
- (¹²) For documentation of Cadmium (Cd), see section 4. Competent authorities shall verify that the total amount of recycled Cadmium ($m_{\text{Cd,output}}$) and safely immobilised and disposed Cadmium ($m_{\text{Cd,waste}}$) corresponds to the total amount of Cadmium in the input ($m_{\text{Cd,input}}$). For documentation of Mercury (Hg), only for Hg-containing batteries, see section 4. Competent authorities shall verify that the total amount of safely immobilised and disposed Mercury ($m_{\text{Hg,waste}}$) corresponds to the total amount of Mercury in the input ($m_{\text{Hg,input}}$).
- (¹³) Indicate the number of verifications executed per technique. For verification of overall calculations, the number shall be 1 reflecting the mandatory verification of calculations submitted by the first recycler. For the other verification techniques, the number can vary from 0 – if none of these were carried out – to 1 – if these other techniques were carried out only on first recycler – up to the total number of actors in the recycling chain – if they were carried out on all the actors of the recycling chain as indicated in part (2) of this template.

Part 2: Individual steps of recycling, i.e. all recycling facilities involved, shall be documented:

Recycling step ⁽¹⁾	N_0
Calendar year	

Facility ⁽¹⁾	Name	
	Street	
	City	
	Country	
	Contact person	
	Tel.	
	Email	

Postal code:

Description of the individual recycling step(s):

Insert in this cell a flow-chart and/or a description of the individual recycling step

(1) Entering the recycling step(s) (waste batteries or their fraction) ⁽²⁾:

Type of input	EWG code	Mass ⁽³⁾ : [t/a]	Member State in which the waste batteries were collected ⁽¹²⁾	

Recycling

(2) Intermediate fractions ⁽⁴⁾

Type of input	EWC code	Mass: [t/a]	Further treatment	Further operator ⁽⁵⁾	Further recycling step
					N_1
					N_2
					N_3
					N_4
					N_5

(3) Input and output fractions that account for rRE and rRM calculations ⁽⁶⁾ generated from waste batteries collected in the Member State, in which the recycler is located

Name of the Member State:

Element or compound, targeted or non targeted ⁽⁷⁾	Input fraction m_{input} [t/a]	Output fraction generated in EU Member States [t/a]	Output fraction ⁽⁸⁾ generated outside the EU [t/a]	Total output fraction generated m_{output} [t/a]	Non-waste fraction containing the element or compound	Destination and yield of the fraction	$m_{\text{Cd, waste}}$ total Cadmium (Cd) ⁽¹³⁾ or $m_{\text{Hg, waste}}$ total Mercury (Hg) ⁽¹³⁾ safely immobilised and disposed [t/a]
Cobalt (Co)							
Copper (Cu)							
Lead (Pb)							
Lithium (Li)							
Nickel (Ni)							
Manganese (Mn)							
Aluminium (Al)							
Steel							
Electrolyte (KOH)							

Electrolyte (NaOH)							
Plastics ⁽⁹⁾							
Cadmium (Cd) ⁽¹³⁾							
Other (please specify) ⁽¹⁰⁾							
m _{input} and m _{output} ⁽¹¹⁾ [t/a] from this step							

(4) Input and output fractions that account for rRE and rRM calculations ⁽⁶⁾ generated from waste batteries collected in another Member State ⁽¹²⁾						Name of the Member State:	
Element or compound, targeted or non targeted ⁽⁷⁾	Input fraction m _{input} [t/a]	Output fraction generated in EU Member States [t/a]	Output fraction ⁽⁸⁾ generated outside the EU [t/a]	Total output fraction generated m _{output} [t/a]	Non-waste fraction containing the element or compound	Destination and yield of the fraction	m _{Cd, waste} total Cadmium (Cd) ⁽¹³⁾ or m _{Hg, waste} total Mercury (Hg) ⁽¹³⁾ safely immobilised and disposed [t/a]
Cobalt (Co)							
Copper (Cu)							
Lead (Pb)							
Lithium (Li)							
Nickel (Ni)							
Manganese (Mn)							
Aluminium (Al)							
Steel							
Electrolyte (KOH)							
Electrolyte (NaOH)							

Plastics ⁽⁹⁾							
Cadmium (Cd) ⁽¹³⁾							
Other (please specify) ⁽¹⁰⁾							
m _{input} and m _{output} ⁽¹¹⁾ [t/a] from this step							

Notes

- ⁽¹⁾ Facility carrying out an individual recycling step. For further recycling steps at different facilities, e.g. N_1, N_2, please copy this entire part 2 and fill in appropriately.
- ⁽²⁾ For step 1 = the same as input into the complete waste battery recycling in part (1) of the template. For subsequent steps = intermediate fractions coming from the previous step.
- ⁽³⁾ Mass of intermediate fraction entering the individual recycling step. For step 1 = the same as input into the complete waste battery recycling in part (1).
- ⁽⁴⁾ For the definition of 'intermediate fraction', see section 1, point 3. For black mass, see section 1, point 5 and ensure that the chemistry of the waste battery, or the main chemistry in mass% in case of mixtures, is indicated next to the term 'black mass', e.g. 'black mass-ZnC' or 'black mass-NMC'.
- ⁽⁵⁾ Facility where the intermediate fraction is treated, including name, street, city, postal code, country, contact person, telephone, email. If the further process step is carried out at the same facility as the preceding step, insert 'same as preceding'.
- ⁽⁶⁾ For definitions of 'input' and 'output' fractions and in particular which fractions are accountable for RE and/or RM calculation, see section 1, points 2 and 4.
- ⁽⁷⁾ Elements and compounds recovered from the input waste battery. For definitions of 'input' and 'output' fractions and in particular which fractions are accountable for RE and/or RM calculation, see section 1, points 2 and 4.
- ⁽⁸⁾ Provide documentary evidence in accordance with Art 72, paragraph 3 of Regulation (EU) 2023/1542, together with this data documentation.
- ⁽⁹⁾ Plastics that are recycled and for which the m_{input} as well as the m_{output} are measured, are indicated in the list separately from carbon at cell level.
- ⁽¹⁰⁾ Add other cells if necessary to specify other elements or compounds. In case waste batteries contain Mercury (Hg), see section 4 for documentation of Mercury (Hg) and provide the total amount of Mercury in the input (m_{Hg,input}) and the amount of safely immobilised and disposed Mercury (m_{Hg,waste}).
- ⁽¹¹⁾ The sum of m_{input} and m_{output} from all steps, e.g. N_0, N_1, N_2 etc., shall equal the total m_{input} and m_{output}

- (¹²) In case batteries stemming from more than one other Member State are recycled, please duplicate the cells and fill in appropriately.
- (¹³) For documentation of Cadmium (Cd), see section 4. Competent authorities shall verify that the total amount of recycled Cadmium ($m_{Cd, output}$) and safely immobilised and disposed Cadmium ($m_{Cd, waste}$) corresponds to the total amount of Cd in the input ($m_{Cd, input}$). For documentation of Mercury (Hg), only for Hg-containing batteries, see section 4. Competent authorities shall verify that the total amount of safely immobilised and disposed Mercury ($m_{Hg, waste}$) corresponds to the total amount of Mercury in the input ($m_{Hg, input}$).

9. Format of documentation for the rate of recycling efficiency and recovery of materials from other waste batteries

Part 1: For recycling of other waste batteries, the following shall be documented:

Rates of recycling efficiency and recovery of materials of other waste battery recycling

Calendar year

Facility (¹)	Name		Postal code:
	Street		
	City		
	Country		
	Contact person		
	Tel.		
	Email		

Description of the complete battery recycling (²):

Insert in this cell a flow-chart and/or a description of the recycling steps

Entering the complete waste battery recycling ⁽³⁾				
Type of waste batteries	EWC code	Mass ⁽⁴⁾ : [t/a]	Member State in which the waste batteries were collected ⁽⁹⁾	

RESULTS – calculated by first recycler – generated from waste batteries collected in the Member State, in which the recycler is located					Name of the Member State:		m _{Hg,waste} : total Mercury (Hg) ⁽¹³⁾ safely immobilised and disposed [t/a]
Element or compound	Input fraction m _{input} ⁽⁵⁾ [t/a]	Output fraction ⁽⁵⁾ generated in EU Member States [t/a]	Output fraction ⁽⁵⁾ generated outside the EU [t/a] ⁽⁹⁾	Total output fraction m _{output} ⁽⁵⁾ [t/a]	rRE ⁽¹⁰⁾ [mass %]	rRM ⁽¹¹⁾ [mass %]	
Cobalt (Co)							
Copper (Cu)							
Lead (Pb)							
Lithium (Li)							
Nickel (Ni)							
Manganese (Mn)							
Aluminium (Al)							
Steel							
Electrolyte (KOH)							
Electrolyte (NaOH)							

Plastics ⁽⁶⁾							
Oxygen (O ₂) ⁽⁷⁾							
Carbon from carbon sources at cell level (C) ⁽⁷⁾							
Iron from iron sources at cell level (Fe) ⁽⁷⁾							
Phosphorus (P) ⁽⁷⁾							
Chlorine (Cl) ⁽⁷⁾							
Sulphur (S) ⁽⁷⁾							
Mercury (Hg) ⁽¹³⁾							
Other (please specify) ⁽⁸⁾							
Total							

RESULTS – calculated by first recycler – generated from waste batteries collected in another Member State ⁽¹⁰⁾ :					Name of the Member State:		
Element or compound	Input fraction m _{input} ⁽⁹⁾ [t/a]	Output fraction ⁽⁹⁾ generated in EU Member States [t/a]	Output fraction ⁽⁹⁾ generated outside the EU [t/a] ⁽⁹⁾	Total output fraction m _{output} ⁽⁹⁾ [t/a]	rRE ⁽¹¹⁾ [mass %]	rRM ⁽¹²⁾ [mass %]	m _{Hg,waste} ; total Mercury (Hg) ⁽¹³⁾ safely immobilised and disposed [t/a]
Cobalt (Co)							
Copper (Cu)							
Lead (Pb)							
Lithium (Li)							
Nickel (Ni)							

Manganese (Mn)							
Aluminium (Al)							
Steel							
Electrolyte (KOH)							
Electrolyte (NaOH)							
Plastics ⁽⁶⁾							
Oxygen (O ₂) ⁽⁷⁾							
Carbon from carbon sources at cell level (C) ⁽⁷⁾							
Iron from iron sources at cell level (Fe) ⁽⁷⁾							
Phosphorus (P) ⁽⁷⁾							
Chlorine (Cl) ⁽⁷⁾							
Sulphur (S) ⁽⁷⁾							
Mercury (Hg) ⁽¹³⁾							
Other (please specify) ⁽⁸⁾							
Total							

VERIFICATION – filled-in by the competent authority (authorities)

Verification techniques ⁽¹⁴⁾

☐

verification of overall calculations

☐

verification of the provision of documentary evidence

☐

auditing by competent authority (including visits to sites)

☐

self-auditing by external companies

Notes

- ⁽¹⁾ Facility treating the waste batteries after collection, possible sorting and preparation for recycling.
- ⁽²⁾ Flowchart or description of the complete recycling, even if carried out at more than one facility, highlighting which are the operations carried out at the first recycler and which are the operations (if any) carried out outside the Union and the related output fractions.
- ⁽³⁾ Description of waste batteries as received after collection, possible sorting and preparation for recycling.
- ⁽⁴⁾ Wet mass of waste batteries as received after collection, possible sorting and preparation for recycling.
- ⁽⁵⁾ For definitions of ‘input’ and ‘output’ fractions and in particular which fractions are accountable for RE and/or RM calculation, see section 1, points 2 and 4.
- ⁽⁶⁾ Plastics that are recycled and for which the m_{input} as well as the m_{output} are measured, are indicated in the list separately from carbon at cell level.
- ⁽⁷⁾ If not taken into account in calculating recycling efficiency in accordance with section 2, point 5 and point 6 of this Annex, leave empty.
- ⁽⁸⁾ Add other cells if necessary to specify other elements or compounds. In case the element has a target for recovery of materials in Part C of Annex XII of Regulation (EU) 2023/1542, provide also the achieved recovery rate rRM.
- ⁽⁹⁾ Provide documentary evidence in accordance with Art 72, paragraph 3 of Regulation (EU) 2023/1542, together with this data documentation.
- ⁽¹⁰⁾ In case waste batteries stemming from more than one other Member State are recycled, please duplicate the cells and fill in appropriately.
- ⁽¹¹⁾ Calculated in accordance with the formula of rRE in section 2 and in accordance with data from part (2) of this template on individual steps of the (related) waste battery recycling.
- ⁽¹²⁾ Calculated in accordance with the formula for rRM(TM) in section 3 and in accordance with data from part (2) of this template on individual steps of the (related) waste battery recycling.
- ⁽¹³⁾ For documentation of Mercury (Hg), only for Hg-containing batteries, see section 4. Competent authorities shall verify that the total amount of safely immobilised and disposed Mercury ($m_{\text{Hg,waste}}$) corresponds to the total amount of Mercury in the input ($m_{\text{Hg,input}}$).
- ⁽¹⁴⁾ Indicate the number of verifications executed per technique. For verification of overall calculations, the number shall be 1 reflecting the mandatory verification of calculations submitted by the first recycler. For the other verification techniques, the number can vary from 0 – if none of these were carried out – to 1 – if these other techniques were carried out only on first recycler – up to the total number of actors in the recycling chain -if they were carried out on all the actors of the recycling chain as indicated in part (2) of this template.

Part 2: Individual steps of recycling, i.e. all recycling facilities involved, shall be documented:

Recycling step ⁽¹⁾	N_0
Calendar year	

Facility ⁽¹⁾	Name	
	Street	
	City	
	Country	
	Contact person	
	Tel.	
	Email	

Postal code:

Description of the individual recycling step(s):

Insert in this cell a flow-chart and/or a description of the individual recycling step

(1) Entering the recycling step(s) (waste batteries or their fraction) ⁽²⁾:

Type of input	EWC code	Mass ⁽³⁾ : [t/a]	Member State in which the waste batteries were collected ⁽¹³⁾

Recycling

(2) Intermediate fractions ⁽⁴⁾							
Type of input		EWC code	Mass: [t/a]	Further treatment		Further operator ⁽⁵⁾	Further recycling step
							N_1
							N_2
							N_3
							N_4
							N_5
(3) Input and output fractions that account for rRE and rRM calculations ⁽⁶⁾ generated from waste batteries collected in the Member State, in which the recycler is located						Name of the Member State:	
Element or compound, targeted or non targeted ⁽⁷⁾	Input fraction m _{input} [t/a]	Output fraction generated in EU Member States [t/a]	Output fraction ⁽⁸⁾ generated outside the EU [t/a]	Total output fraction generated m _{output} [t/a]	Non-waste fraction containing the element or compound	Destination and yield of the fraction	Mercury (Hg) ⁽¹⁴⁾ safely immobilised and disposed [t/a]
Cobalt (Co)							
Copper (Cu)							
Lead (Pb)							
Lithium (Li)							
Nickel (Ni)							
Manganese (Mn)							
Aluminium (Al)							
Steel							

Electrolyte (KOH)							
Electrolyte (NaOH)							
Plastics ⁽⁹⁾							
Oxygen (O ₂) ⁽¹⁰⁾							
Carbon from carbon sources at cell level (C) ⁽¹⁰⁾							
Iron from iron sources at cell level (Fe) ⁽¹⁰⁾							
Phosphorus (P) ⁽¹⁰⁾							
Chlorine (Cl) ⁽¹⁰⁾							
Sulphur (S) ⁽¹⁰⁾							
Mercury (Hg) ⁽¹⁴⁾							
Other (please specify) ⁽¹¹⁾							
m _{input} and m _{output} ⁽¹²⁾ [t/a] from this step							

(4) Input and output fractions that account for rRE and rRM calculations ⁽⁶⁾ generated from waste batteries collected in another Member State ⁽¹³⁾						Name of the Member State:	
Element or compound, targeted or non targeted ⁽⁷⁾	Input fraction m _{input} [t/a]	Output fraction generated in EU Member States [t/a]	Output fraction ⁽⁸⁾ generated outside the EU [t/a]	Total output fraction generated m _{output} [t/a]	Non-waste fraction containing the element or compound	Destination and yield of the fraction	Mercury (Hg) ⁽¹⁴⁾ safely immobilised and disposed [t/a]
Cobalt (Co)							
Copper (Cu)							
Lead (Pb)							
Lithium (Li)							
Nickel (Ni)							
Manganese (Mn)							
Aluminium (Al)							
Steel							
Electrolyte (KOH)							
Electrolyte (NaOH)							
Plastics ⁽⁹⁾							
Oxygen (O ₂) ⁽¹⁰⁾							
Carbon from carbon sources at cell level (C) ⁽¹⁰⁾							
Iron from iron sources at cell level (Fe) ⁽¹⁰⁾							
Phosphorus (P) ⁽¹⁰⁾							

Chlorine (Cl) ⁽¹⁰⁾							
Sulphur (S) ⁽¹⁰⁾							
Mercury (Hg) ⁽¹⁴⁾							
Other (please specify) ⁽¹¹⁾							
m _{input} and m _{output} ⁽¹²⁾ [t/a] from this step							

Notes

- ⁽¹⁾ Facility carrying out an individual recycling step. For further recycling steps at different facilities, e.g. N_1, N_2, please copy this entire part 2 and fill in appropriately.
- ⁽²⁾ For step 1 = the same as input into the complete waste battery recycling in part (1) of the template. For subsequent steps = intermediate fractions coming from the previous step.
- ⁽³⁾ Mass of intermediate fraction entering the individual recycling step. For step 1 = the same as input into the complete waste battery recycling in part (1).
- ⁽⁴⁾ For the definition of 'intermediate fraction', see section 1, point 3. For black mass, see section 1, point 5 and ensure that the chemistry of the waste battery, or the main chemistry in mass% in case of mixtures, is indicated next to the term 'black mass', e.g. 'black mass-ZnC' or 'black mass-NMC'.
- ⁽⁵⁾ Facility where the intermediate fraction is treated, including name, street, city, postal code, country, contact person, telephone, email. If the further process step is carried out at the same facility as the preceding step, insert 'same as preceding'.
- ⁽⁶⁾ For definitions of 'input' and 'output' fractions and in particular which fractions are accountable for RE and/or RM calculation, see section 1, points 2 and 4.
- ⁽⁷⁾ Elements and compounds recovered from the input waste battery. For definitions of 'input' and 'output' fractions and in particular which fractions are accountable for RE and/or RM calculation, see section 1, points 2 and 4.
- ⁽⁸⁾ Provide documentary evidence in accordance with Art 72, paragraph 3 of Regulation (EU) 2023/1542, together with this data documentation.
- ⁽⁹⁾ Plastics that are recycled and for which the m_{input} as well as the m_{output} are measured, are indicated in the list separately from carbon at cell level.
- ⁽¹⁰⁾ If not taken into account in calculating recycling efficiency in accordance with section 2, point 5 and point 6 of this Annex, leave empty.
- ⁽¹¹⁾ Add other cells if necessary to specify other elements or compounds

- (¹²) The sum of m_{input} and m_{output} from all steps, e.g. N_0 , N_1 , N_2 etc., shall equal the total m_{input} and m_{output}
- (¹³) In case batteries stemming from more than one other Member State are recycled, please duplicate the cells and fill in appropriately.
- (¹⁴) For documentation of Mercury (Hg), only for Hg-containing batteries, see section 4. Competent authorities shall verify that the total amount of safely immobilised and disposed Mercury ($m_{\text{Hg,waste}}$) corresponds to the total amount of Mercury in the input ($m_{\text{Hg,input}}$).

10. Method for verifying rates of recycling efficiency and recovery of materials from waste batteries

- (1) Verification of the rates of recycling efficiency and recovery of materials from waste batteries, as documented by the first recycler, shall cover at least the following areas:
 - documentation;
 - data confidentiality;
 - verification techniques.
- (2) Verification of the overall calculations shall be carried out by the competent authority (or authorities) of the Member State in which the waste battery treatment is performed. That authority shall forward relevant data ⁽²⁾ to the Member States in which the waste batteries were collected (if different).
- (3) Documentation shall be provided by the first recycler to the competent authority (or authorities) of the Member State in which the waste battery treatment is performed, in accordance with the following requirements:
 - the layout for the documentation shall comply with the templates set out in sections 6 to 9. In particular, it shall cover, in a comprehensive and structured way, all individual steps of the waste battery recycling, i.e. all recycling facilities involved, but not the individual recycling operations carried out within one facility, and the corresponding input, intermediate and output fractions, in accordance with Article 75(5) of Regulation (EU) 2023/1542;
 - the format of the documentation shall be electronic, and it shall be such to be handled through world-deployed software.
- (4) Where waste holders other than waste management operators carrying out treatment and recyclers export batteries for treatment, verification shall be carried out by the competent authority of the Member States in which those waste holders exporting the waste batteries are located.
- (5) The competent authority (or authorities) shall treat all the data and information examined for the verification procedures confidentially and shall use them only for the verification procedure itself.
- (6) The competent authority (or authorities) shall apply at least the following techniques for verification:
 - verification of the completeness, accuracy and consistency of the overall calculations and information contained in the documentation (see sections 6 to 9);
 - for batteries that are wholly or partly recycled outside the EU, verification that documentary evidence, approved by the competent authority of the destination country, that the recycling took place under conditions that are equivalent to those required by Regulation (EU) 2023/1542 and in accordance with other Union law regarding human health and environmental protection, has been provided;
 - aggregation and verification of the consistency and completeness of all the data supplied by the various first recyclers.
- (7) The competent authority (or authorities) may also verify the accuracy, reliability and traceability of the recycling and the corresponding rates provided by requesting evidence from relevant parties in the recycling chain (such as a contract, transportation document, or contact details of other recyclers in the recycling chain) documenting the existence of the flows during the documentation period. The competent authority (or authorities) may also carry out verification by auditing relevant parties in the recycling chain, in accordance with the decisions of the Member States. In any case, this shall not exclude visits to recycling facilities as part of the auditing procedure.

⁽²⁾ This shall contain all the relevant information and data received by first recyclers that relate to waste batteries collected in the respective Member State but not information and data that relate to waste batteries collected in other Member States.

- (8) Recyclers may also carry out self-auditing through external companies. In this case, recyclers may provide the competent authority (or authorities) with the results of the auditing process at the time of the minimum verification. If notified of the results, the competent authority (or authorities) shall fill in the appropriate section on verification in the corresponding documentation (see sections 6 to 9).
 - (9) Verification of the overall calculations and information shall be carried out every calendar year, on the basis of the documentation provided by first recyclers (see sections 6 to 9). Additional verification techniques referred to in point (7) may be carried out whenever requested by the competent authority (or authorities) of the Member State. Self-auditing referred to in point (8) may be carried out by recyclers whenever they find it appropriate.
 - (10) After, at least, the minimum verification and before forwarding the verified documentation to the Member State in which the waste battery was collected (if different), the competent authority (or authorities) shall properly complete the documentation indicating the number of verification techniques carried out.
 - (11) The verification may be carried out per battery chemistry (lead-acid, lithium-based, nickel-cadmium, others) or per specific chemistry of the different families.
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