GS1 in Europe Battery Regulation Guideline: Industrial batteries

Implementation guideline for industrial batteries under Regulation (EU) 2023/1542

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Disclaimer

Status of this document
This is version 1.0 (13 November 2026) of the GS1 in Europe guideline for industrial batteries. It is a final release and is shared for information. It will be updated when the legislation, its secondary acts or the GS1 standards change.

Based on legislation, not a legal document
This guideline is based on Regulation (EU) 2023/1542 on batteries and waste batteries, related EU legislation (including delegated and implementing acts), and European Commission guidance and data models, as available on 13 November 2026. These texts are still being developed and amended, and later changes may not yet be reflected here.

This guideline is not a legal document and does not give legal advice. Only the official legal texts, as published in the Official Journal of the European Union, are binding. Each economic operator remains fully responsible for its own compliance with the applicable legislation.

How this guideline was developed
This guideline was first developed as a generic approach for all battery categories covered by the regulation. It was then translated into this standalone guideline for industrial batteries. Some explanations may therefore also apply to other battery categories.

Use of GS1 standards
The use of GS1 standards is not required by the legislation, and this guideline does not make it a requirement. The guideline shows how GS1 standards *could* be used to meet the legal requirements. Companies are free to choose other solutions that comply with the legislation.

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1 Introduction

1.1 The Battery Regulation and this guideline

Regulation (EU) 2023/1542 of 12 July 2023 concerns batteries and waste batteries. It replaces the former Batteries Directive (Directive 2006/66/EC) and creates one framework for the whole battery lifecycle: sustainability and safety requirements, labelling and information, conformity assessment, battery due diligence, extended producer responsibility, and the collection, treatment and recycling of waste batteries. It applies to all batteries, regardless of their shape, volume, weight, design, material composition, chemistry, use or purpose, subject to its express exclusions (Article 1(3), (5)–(6)). This guideline focuses on industrial batteries.

The Regulation applies in stages. It has applied generally since 18 February 2024, while many provisions apply from later dates. Some of these dates depend on secondary legislation, such as delegated and implementing acts.

For industrial batteries, the Regulation covers the following topics. Each is explained in a chapter of this guideline:

- product requirements, such as restricted substances, carbon footprint, recovered-material content, performance and durability, operational data and stationary-system safety (chapter 2);
- the responsibilities of manufacturers, importers, distributors and other actors (chapter 3);
- labels, the QR code that gives access to information and, above 2 kWh, the battery passport (chapter 4);
- batteries that are incorporated in or supplied with products (chapter 5);
- battery due diligence (chapter 8);
- producer registration, extended producer responsibility and reporting (chapter 9);
- collection, treatment, recycling and re-use (chapters 10 and 11);
- the dates from the Battery Regulation that matter for industrial batteries (chapter 14);
- the data that describes a battery, attribute by attribute (chapter 15).

In practice, operators need reliable data about batteries, the parties involved and the events that occur across the value chain. This calls for common identifiers, clear relationships between data and interoperable ways to access and exchange information.

This guideline explains what the Regulation requires for industrial batteries and how GS1 standards support the identification, information access, data exchange and evidence functions that follow from those requirements.

The guideline is meant for manufacturers, importers, distributors, producers and other professional operators responsible for industrial batteries, together with the teams and service providers that implement their identification and information systems.

1.2 GS1 in Europe

GS1 in Europe is the regional platform of GS1, the global not-for-profit standards organisation. It brings together the national GS1 organisations in 49 countries. These organisations govern GS1 in Europe through a Board of Directors made up of their Executive Directors.

GS1 in Europe supports a common system of standards for identifying products, locations and other entities and for sharing the related data between businesses. It works with national GS1 organisations, industry, trade associations and public authorities to promote the adoption of these standards across Europe. Companies obtain GS1 identification keys through their national GS1 organisation, which can also advise on national implementation.

For the Battery Regulation, GS1 in Europe is developing guidance on the use of GS1 identifiers and data carriers, of which this guideline is part. Related work includes a generic data model for batteries and open, interoperable ways to exchange battery data.

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This guideline uses the following GS1 standards. Their contribution and limits are explained where they are used.

GS1 standard	What it does	Used in this guideline for	Chapters
GTIN (Global Trade Item Number)	Identifies a trade item. With a batch/lot number or a serial number it distinguishes a production batch or an individual instance.	The battery model or trade item, a pack, and the scope of evidence	6, 7
GLN (Global Location Number)	Identifies a legal entity, party, function or location.	Operators, producers, sites and collection points	6, 9, 10
SSCC (Serial Shipping Container Code)	Identifies a logistic unit.	Transport, storage and collection units	6, 10, 12
GS1 Digital Link	Represents a GS1 identifier as a web address, giving web-enabled identification and an entry point to online resources.	The address carried by the QR code	4 and 7
EPCIS and CBV	Capture and share visibility events and the business vocabulary around them.	Shipments, packing, installation and treatment records	12
GDSN (Global Data Synchronisation Network)	Exchanges standardised trade-item master data between trading partners.	Master data, where its coverage has been verified	9

1.3 What this means for industrial batteries

From 18 February 2027, an industrial battery placed on the market or put into service requires a passport when capacity is greater than 2 kWh. At exactly 2 kWh or less it has no Article 77 passport and follows Article 13(6)(b); above the threshold its QR route is Article 13(6)(a). If capacity is not established, further information is required before choosing the route (Articles 13(6) and 77(1)).

The Regulation requires identification, information access and evidence but does not prescribe GS1 standards for these functions. This guideline proposes GS1 identification, GS1 Digital Link and relevant data-exchange standards.

GTIN identifies a battery trade item; batch/lot and serial qualifiers distinguish production batches and individual instances. GLN identifies parties and locations, SSCC identifies logistic units, and EPCIS captures and shares visibility events. The following chapters explain the contribution and limits of each component.

A QR code, its encoded identifier, the information service, physical labels and CE marking have different functions; a QR code alone is not a passport. Chapter 1.4 gives the category test, and chapter 16 explains the terms used here. Capacity, rechargeability, exclusively external storage and stationary-system status are separate assessment facts. The passport threshold does not decide all industrial duties (Articles 7–8, 10, 12 and 14; OQ-REG-005).

The scope exclusions in Article 1(5) remain applicable. For equipment specifically designed for the safety of nuclear installations, Article 1(6) excludes Chapters III and IX of the Regulation, which cover labelling, marking and information, including the QR code, and the digital battery passport. Chapter VIII of the Regulation on waste batteries still applies. Assess the remaining provisions separately for that configuration.

1.4 How to read this guideline

The guideline follows the questions an operator needs to answer. What does the Regulation require? Who is responsible? Which battery and which information are concerned? How do GS1 standards support the implementation? Where a chapter proposes the use of GS1 standards, it separates what the Regulation requires from what this guideline proposes, and it states the limits of the standard.

How this guideline was created. This guideline is one of five category guidelines: portable batteries, light means of transport (LMT) batteries, starting, lighting and ignition (SLI) batteries, industrial batteries and electric vehicle (EV) batteries. All five are based on the GS1 in Europe master guideline, which covers every battery category. Each category guideline takes the common sections of the master and its category-specific section and presents what applies to that category as a document that can be read on its own. Because they share one basis, the five guidelines use the same structure, terms and conventions.

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Check the category first. This guideline applies to industrial batteries: batteries that are specifically designed for industrial uses, intended for such uses after preparation for repurposing or repurposing, or otherwise weigh more than 5 kg and are neither EV, LMT nor SLI batteries (Article 3(1), point (13)). Confirm the category before relying on the guideline; chapter 16 gives the definition of each category. A battery that falls into another category, such as a portable, LMT, SLI or electric vehicle battery, is assessed under that category, and the battery-passport outcome may then differ.

Choose a reading path. Read chapters 1 to 5 for the regulatory outcome, then the chapters that match your role:

Your situation	Start with	Then read
Manufacturer or brand owner placing industrial batteries on the market	Chapters 2, 3 and 4	Chapters 6 and 7, and chapter 8 where due diligence applies
Importer or distributor	Chapters 3 and 4	Chapter 9 for producer status and chapter 10.1 for take-back
Maker of a product that incorporates an industrial battery	Chapter 5	Chapters 4 and 6
Producer or producer responsibility organisation	Chapter 9	Chapter 10 and chapter 14
Collector, treatment operator or recycler	Chapter 10	Chapters 11 and 12
Operator re-using, repurposing or remanufacturing batteries	Chapter 11	Chapters 3 and 4
IT, data or GS1 implementation specialist	Chapters 6, 7 and 12	Chapters 13 and 15
Compliance reviewer checking dates and open points	Chapter 14	The chapter cited in each row

Conventions used in this guideline.

- **Provisions.** Article numbers refer to Regulation (EU) 2023/1542 unless another act is named. The requirement tables have a provision column so that each statement can be checked against the legal text.
- **Required or proposed.** A statement that cites a provision describes what the Regulation requires. A statement introduced as a proposal or recommendation of this guideline is an implementation choice, not a legal duty.
- **Dates.** Chapter 14 lists the dates in one table. Where a date depends on a later act ("whichever is later"), check that act before treating the duty as operative.
- **Open points.** Codes such as OQ-REG-003 mark open legal questions. Chapter 14 lists those that concern industrial batteries and explains their status. Check the open point before relying on the statement that cites it.
- **Technical basis.** Paragraphs headed "Technical basis" name the GS1 standard and section behind an explanation. They are mainly for the people who implement it.
- **References and terms.** References such as "chapter 14" point to this document, while "Chapter VII of the Regulation" points to the Regulation. Chapter 16 explains the terms and abbreviations.
- **Limits.** Identifiers, QR codes and event records support the retrieval of evidence. They do not demonstrate conformity. Registration, producer responsibility and reporting arrangements differ between Member States, so confirm them nationally.

2 Product requirements and evidence

A battery may be placed on the market or put into service only if it meets the requirements that apply to it and does not present a risk to human health, the safety of persons, property or the environment (Article 5). This chapter sets out the requirements that apply to industrial batteries.

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2.1 What applies to industrial batteries

Requirement	Effect on industrial batteries	Provision
Restricted substances	The mercury limit applies, and the other Annex I entries apply where their conditions are met	Article 6; Annex I
Carbon footprint	For rechargeable industrial batteries above 2 kWh, a declaration for each battery model per manufacturing plant, and later a performance-class label and a maximum life-cycle threshold. Later dates apply to batteries with exclusively external storage	Article 7(1)–(3); Annex II
Recovered-material content	For industrial batteries above 2 kWh, other than those with exclusively external storage, documentation and later minimum shares, where the materials are present	Article 8(1)–(3)
Performance and durability	For rechargeable industrial batteries above 2 kWh, a document with the values and a technical explanation, and later minimum values that exclude batteries with exclusively external storage	Article 10(1)–(2); Annex IV, Part A
Stationary-system safety	For stationary battery energy storage systems of any capacity, technical documentation showing compliance with the safety parameters and how other hazards are addressed	Article 12; Annex V
State of health and expected lifetime	For stationary battery energy storage systems, current data in the battery management system, read-only access for specified purposes and a software reset function	Article 14; Annex VII

The 2 kWh threshold decides the passport outcome, but it does not decide every other duty. Capacity, rechargeability, exclusively external storage and stationary-system status are separate facts to establish for each battery (OQ-REG-005). Article 9 does not apply. Article 11 applies only if the battery also falls within a category that Article 11 addresses, so classify the battery first.

2.2 Restricted substances

Industrial batteries must not contain substances restricted by Annex I unless the conditions in that Annex are met. This applies in addition to Annex XVII to Regulation (EC) No 1907/2006 and Article 4(2)(a) of Directive 2000/53/EC. A general statement of "substance compliance" does not replace a check of the current Annex I for the substance, battery and use concerned (Article 6).

Substance	Batteries concerned	Limit by weight	Exceptions	Reference
Mercury	All batteries, whether or not incorporated in appliances, light means of transport or other vehicles	0.0005%	None	Annex I, entry 1
Hexavalent chromium	Batteries incorporated in M1 and N1 vehicles	0.1% in homogeneous material	None stated	Annex I, entry 4

This table shows Annex I as replaced by Regulation (EU) 2026/1738 (Article 53 and Annex XII), which applies from 13 August 2026 (Article 59(2)). M1 and N1 vehicles include special purpose vehicles of those categories, and batteries in other vehicle categories fall under the general entries only. M1 and N1 are the categories of passenger cars and light goods vehicles in Regulation (EU) 2018/858. The cadmium and lead entries of Annex I name portable, EV and SLI batteries, not industrial batteries. Open points remain on how Article 4(2)(a) of Directive 2000/53/EC applies to batteries until 31 August 2032 and how "homogeneous material" applies to a battery (OQ-REG-016).

2.3 Carbon footprint

Article 7 sets carbon-footprint requirements for certain battery categories. It currently applies to EV batteries, LMT batteries and rechargeable industrial batteries above 2 kWh, so it applies to rechargeable industrial batteries above 2 kWh but not to other industrial batteries. Rechargeable industrial batteries above 2 kWh are subject to three stages. Each depends on delegated or implementing acts: a stage starts on the date shown or after the stated period following entry into force of the relevant act, whichever is later. The current methods, formats, classes and thresholds need checking before a date or value is treated as operative (OQ-REG-018).

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Stage	Other than exclusively external storage	Exclusively external storage	Provision
Declaration with the Article 7(1) information	18 February 2026 or 18 months after the relevant acts enter into force	18 August 2030 or 18 months after the relevant acts enter into force	Article 7(1); Annex II
Label with the carbon footprint and performance class, with the calculation shown in the technical documentation	18 August 2027 or 18 months after the relevant acts enter into force	18 February 2032 or 18 months after the relevant acts enter into force	Article 7(2); Annex II, point 8
Evidence that the declared life-cycle value is below the applicable maximum	18 February 2029 or 18 months after the relevant act enters into force	18 August 2033 or 18 months after the relevant act enters into force	Article 7(3); Annex II, point 9

The declaration is drawn up for each battery model per manufacturing plant, not automatically for each individual battery. Until it is accessible through the QR code, it accompanies the battery. The requirements do not apply where a battery was already placed on the market or put into service before preparation for re-use, preparation for repurposing, repurposing or remanufacturing. This does not cover a newly manufactured battery or one first placed on the market only after the operation (Article 7(5)).

2.4 Recovered-material content

Article 8 deals with the share of cobalt, lead, lithium and nickel in a battery that comes from recovered waste. It applies to industrial, EV, LMT and SLI batteries, but not to portable batteries. Industrial batteries above 2 kWh, other than those with exclusively external storage, containing cobalt, lead, lithium or nickel within the scope of Article 8 are subject to its documentation and minimum-share requirements. The duty depends on category and material content.

Stage	What it requires	When it applies	Provision
Documentation	Document the shares of cobalt, lithium and nickel present in active materials and recovered from battery manufacturing waste or post-consumer waste, and the share of lead present in the battery and recovered from waste, for each battery model per year and per manufacturing plant	18 August 2028 or 24 months after the Article 8(1) delegated act enters into force, whichever is later	Article 8(1)
First minimum shares	Demonstrate 16% cobalt, 85% lead, 6% lithium and 6% nickel in the technical documentation	18 August 2031	Article 8(2)
Later minimum shares	Demonstrate 26% cobalt, 85% lead, 12% lithium and 15% nickel	18 August 2036	Article 8(3)

The shares may be amended or supplemented, so check current law and the adopted calculation method and format (Article 8(5)–(6); OQ-REG-018). The records work at the level of model, year and plant. Article 8(1)–(3) does not apply to batteries already placed on the market or put into service before preparation for re-use, preparation for repurposing, repurposing or remanufacturing (Article 8(4)).

A battery with a passport has an individual identifier, but that does not make an individual calculation necessary. Access to an individual battery resolves to the correct model, year and plant record.

2.5 Performance and durability

Since 18 August 2024, a rechargeable industrial battery above 2 kWh must be accompanied by a document containing the applicable Annex IV, Part A performance and durability values. The technical documentation must explain the specifications, standards and conditions used to measure, calculate or estimate those values (Article 10(1); Annex VIII).

Rechargeable industrial batteries above 2 kWh must also meet minimum values, which are set by a delegated act. They apply from 18 August 2027 or 18 months after that act enters into force, whichever is later. Batteries with exclusively external storage are excluded. Check which act applies before you set operational requirements (Article 10(2) and (5); OQ-REG-018).

These requirements do not apply after preparation for re-use, preparation for repurposing, repurposing or remanufacturing where the operator demonstrates that the battery had already been placed on the market

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or put into service before the requirement became applicable (Article 10(4)). Values must belong to the battery and must not be attributed to a host product.

2.6 Safety of stationary battery energy storage systems

The safety requirements apply whatever the capacity, whether or not the system exceeds the passport threshold (Articles 12 and 77(1)). A stationary battery energy storage system must be safe during normal operation and use. Since 18 August 2024, the technical documentation must:

- demonstrate compliance and successful testing for the applicable Annex V parameters, using state-of-the-art methods;
- assess hazards that Annex V does not address, and evidence successful mitigation and testing; and
- include mitigation instructions for hazards that could occur, such as fire or explosion.

A parameter applies only where the corresponding hazard exists under the conditions envisaged by the manufacturer. The documentation must be reviewed after preparation for re-use, preparation for repurposing, repurposing or remanufacturing (Article 12).

2.7 State of health and expected lifetime

For stationary battery energy storage systems, whatever their capacity, the battery management system must have held up-to-date data on the Annex VII parameters since 18 August 2024 (Article 14). This does not extend to every industrial battery above 2 kWh.

Read-only access must be provided, on a non-discriminatory basis and respecting the manufacturer's intellectual property rights, to the person who legally purchased the battery, including an independent operator or waste management operator, or a third party acting for that person. Access is limited to energy-storage participation; evaluation of residual value, remaining lifetime or capability for further use; and facilitating the listed circular operations (Article 14(2)).

The system must include a software reset function where a circular operator needs different software. If it is used, the original manufacturer is not liable for a breach attributable to software uploaded after placing on the market (Article 14(3)). The battery management system is not a battery passport: above 2 kWh the passport is a separate record, and at or below 2 kWh there is no passport (OQ-REG-005).

2.8 How GS1 standards support implementation

The Regulation requires the evidence described above but does not prescribe GS1 standards. The following GS1 applications link documents and data to the relevant battery model, batch/lot or individual battery and support retrieval. The identifiers and event records do not validate composition, calculate the required values or establish conformity.

Requirement	How GS1 standards support it	Granularity and limitations
Restricted substances	GTIN identifies the model linked to a controlled material declaration. GTIN plus batch/lot number links production evidence to a batch, and GTIN plus serial number supports an investigation of one battery. GLN identifies a manufacturer, testing function or manufacturing location. EPCIS shares material-receipt, production, release, recall and corrective-action events.	Model level fits an unchanged specification; batch level fits inputs or test results that vary between production batches. A GLN does not replace a legally required identity, accreditation or authority-issued identifier.
Carbon footprint	GTIN plus batch/lot number gives access to the declaration, provided that the batch/lot links to a single manufacturing plant. GLN identifies that plant. A GS1 Digital Link URI encoded in the QR code helps parties reach the information.	The Regulation does not require a batch/lot number, but the record has to distinguish the manufacturing plant. This guideline therefore proposes GTIN plus batch/lot number, so that the record links clearly to the model, plant and production batch.
Recovered-material content	GTIN plus batch/lot number links a battery to its documented content, provided that the batch has the same content. GLN identifies the manufacturing plant, and the production record holds the year. A GS1 Digital Link URI helps parties	The information has to distinguish models, years and plants, so this guideline proposes at least GTIN plus batch/lot number. GTIN plus serial number, used for the passport, also gives access to the right record.

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Requirement	How GS1 standards support it	Granularity and limitations
	reach the model, year and plant information.	Identifying raw materials makes recovered content easier to track.
Performance and durability	GTIN identifies the model that the values apply to. Master data associated with that GTIN holds the values, and a GS1 Digital Link URI gives access to them.	The values are normally common to a model, so GTIN is sufficient at model level. GDSN exchanges this master data only where attribute coverage has been verified. No published GS1 Web Vocabulary term for these data points was found.
Safety of stationary systems	Master data about the model shares safety information and instructions. A GS1 Digital Link URI gives access to them. GTIN plus serial number links the documentation to one system, and EPCIS shares commissioning, inspection, maintenance or circular-operation events.	Model level is sufficient for safety instructions. At or below 2 kWh, instance-level identification is an implementation choice.
State of health and expected lifetime	GTIN gives access to information about safety, tests and instructions for a model. GTIN plus serial number identifies the individual battery whose condition is tracked. A GS1 Digital Link URI is an entry point to access-controlled resources, and EPCIS supports lifecycle events.	Condition changes over time, so model master data is not sufficient. Access is provided through the battery management system under Article 14; GS1 identifiers do not grant it.

Technical basis: GS1 General Specifications, release 26.0, sections 1.3.1–1.3.1.4, pp. 35–40, and 1.3.3–1.3.4, pp. 49–54.

3 Responsible actors and conformity

Duties depend on the organisation's role in the particular battery transaction, and one organisation can hold several roles (Article 3(1), point (22)). The Regulation does not prescribe GLN for identifying these parties. GLN identifies a legal entity, party, function or location and provides a common reference for linking it to the relevant records. It does not determine the legal role or replace authority-issued identifiers. Technical basis: GS1 General Specifications, sections 1.3.3–1.3.4, pp. 49–54.

3.1 The economic operators

Role	Who it is	Main duties	Provision
Manufacturer	The person that manufactures a battery, or has one designed or manufactured, and markets it under its own name or trade mark or puts it into service for its own purposes	See below	Article 3(1), point (33); Article 38
Authorised representative	A person established in the Union, appointed by written mandate	Keeps the declaration and specified documents for ten years, supplies conformity evidence on a reasoned request, cooperates on risks and immediately notifies authorities of a risk. The mandate cannot transfer the product-compliance duties, the technical documentation or the due-diligence duties	Article 3(1), point (63); Article 40
Importer	A person established in the Union that places a battery from a third country on the Union market	Verifies the conformity assessment, technical documentation, declaration, CE marking, other markings and labels, accompanying documents, instructions, safety information and manufacturer details before placing the battery. Adds its own name or trade mark and contact details on the battery or, where impossible, its packaging or accompanying document	Article 3(1), point (64); Article 41
Distributor	A supply-chain person other than	Acts with due care. Verifies producer	Article 3(1), point

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Role	Who it is	Main duties	Provision
	the manufacturer or importer that makes a battery available	registration, CE marking, other markings and labels, accompanying material and manufacturer and importer details before making the battery available	(65); Article 42
Fulfilment service provider	A person handling warehousing, packaging, addressing and dispatching	Ensures these do not jeopardise compliance, cooperates with authorities and immediately informs them of a risk	Article 43
Producer	A role under extended producer responsibility, decided per Member State (chapter 9). Not the same as the manufacturer	Registers, finances and reports	Article 3(1), point (47); Articles 55–58 and 75

Importers and distributors protect conformity during storage and transport. Where appropriate to the risk, importers also sample-test batteries, investigate complaints, keep a register where necessary and inform distributors of this monitoring (Articles 41 and 42). Instructions and safety information are provided in the language or languages determined by the relevant Member State (Article 38).

3.2 Manufacturer duties

Manufacturers must (Article 38(1)–(8)):

- ensure compliance with the applicable requirements, which for industrial batteries means Article 6 and, according to capacity, rechargeability and stationary-system status, Articles 7, 8, 10, 12 and 14;
- provide clear instructions and safety information in the required language or languages;
- apply the required markings and labels (chapter 4);
- draw up technical documentation and carry out, or have carried out, the applicable conformity assessment before placing the battery on the market or putting it into service;
- after conformity is demonstrated, draw up the EU declaration of conformity and affix the CE marking;
- maintain procedures so that series-produced batteries remain conforming;
- provide the required battery identification and manufacturer contact information, namely name, registered trade name or trade mark, postal address, and a website and email address if available (Article 38(6)–(7)); and
- where Article 14 applies, provide access to the Annex VII parameters through the battery management system.

Cell and module suppliers must provide manufacturers, free of charge, with the information and documentation needed for compliance (Article 39).

3.3 When another actor becomes the manufacturer

An importer or distributor is treated as the manufacturer if it places a battery on the market or puts it into service under its own name or trade mark, modifies a battery already on the market so that compliance could be affected, or changes its purpose (Article 44). An operator carrying out preparation for re-use, preparation for repurposing, repurposing or remanufacturing and then placing the battery on the market or putting it into service is also treated as the manufacturer (Articles 38(11) and 45; chapter 11).

3.4 Conformity assessment

The manufacturer has to show that a battery meets the applicable requirements. This is done through a conformity assessment, using the module in the table that fits the requirements and the type of production. A module is a fixed procedure from Annex VIII. The Regulation does not define series and non-series production. In practice, Modules A and D1 work at battery-model level, while Module G verifies each battery individually.

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Requirements assessed	Series production	Non-series production	Provision
Articles 6, 10 and 12–14, as applicable to the battery	Module A or D1	Module A or G	Article 17(1)
Articles 7 and 8, as applicable to the battery	Module D1	Module G	Article 17(2)
Additional assessment after listed circular operations	Module A	Module A	Article 17(3)

Source: Article 17(1)–(3); Annex VIII, Parts A–C.

What the modules mean:

- Module A (internal production control): the manufacturer carries out the assessment under its own responsibility.
- Module D1 (production quality system): a notified body assesses the manufacturer's production quality system and monitors it.
- Module G (unit verification): a notified body verifies the individual unit.

Records and correspondence with a notified body use the official language or languages of the country where the notified body is established, or another language it accepts (Article 17(4)).

The conformity-assessment provisions apply from 18 August 2024, except for the assessment of carbon-footprint and recovered-material requirements, which applies 12 months after the first publication of the notified-body list. Verify that date against current law (Article 96(2)(b)). Assessment covers the applicable requirements only, and GS1 standards do not replace it.

3.5 Technical documentation

Before placing a battery on the market or putting it into service, the manufacturer draws up documentation that enables conformity assessment and contains an adequate risk analysis. Depending on the module and the applicable requirements, it includes the description and intended use; design and manufacturing material; a specimen of the required label; applied standards and specifications; alternative solutions; calculations and evidence; applicable carbon-footprint and recovered-material studies; and test reports (Article 38(2); Annex VIII, Parts A–C, point 2). It must be retrievable and supplied to authorities on request (Articles 38(10), 41(7)–(8) and 42(6)).

The Regulation does not prescribe GS1 identifiers for linking technical documentation to the batteries it covers. GTIN identifies the battery trade item and provides a reference for its model-level technical documentation. GTIN plus serial number identifies an individual battery and links records specific to that unit. The documentation system maintains these relationships; the identifiers themselves do not contain the documents. Technical basis: GS1 General Specifications, sections 1.3.1 and 1.3.1.4, pp. 35–36 and 39–40.

3.6 EU declaration of conformity

The declaration states that conformity with the applicable product requirements has been demonstrated. It follows Annex IX, includes the applicable Annex VIII elements, is kept current, is translated as required by the Member State, and is electronic, with paper supplied on request (Article 18(1)–(2)). Where several Union acts require an EU declaration of conformity for the battery, a single declaration covers those acts and states their publication references; it may comprise declarations already drawn up under those acts. By drawing up the declaration, the manufacturer assumes responsibility for the battery's compliance with this Regulation (Article 18(3)–(5)).

Under Modules A and D1, the declaration identifies the battery model; under Module G, it identifies the individual battery assessed (Annex VIII, Part A, point 4; Part B, point 7.2; Part C, point 5). The Regulation does not prescribe GS1 identifiers for this purpose. In the GS1 approach proposed here, GTIN identifies the battery trade item associated with the model-level declaration. GTIN plus serial number identifies the individual battery associated with a Module G declaration. GTIN alone does not distinguish individual batteries.

A model-level declaration remains distinct from an individual battery passport. From 18 February 2027, each industrial battery above 2 kWh placed on the market or put into service requires its own passport, even when several batteries share a model-level declaration (Article 77(1)). Supporting records link each individual passport-scope battery to the applicable declaration. Industrial batteries at or below 2 kWh do

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not require that passport. Technical basis: GS1 General Specifications, sections 1.3.1 and 1.3.1.4, pp. 35–36 and 39–40.

3.7 CE marking

CE marking shows conformity with applicable Union harmonisation legislation; it is not a battery, batch or party identifier. It must be visible, legible and indelible and be affixed before placing on the market or putting into service. If marking the battery is impossible or not warranted because of its nature, it goes on the packaging and accompanying documents. Where a notified body is required, its number follows the CE marking (Article 3(1), point (36); Articles 19–20).

3.8 Record retention

Record	Actor	Period	Provision
Technical documentation and declaration	Manufacturer	Ten years; read Article 38(4) together with the selected Annex VIII module	Article 38(4); Annex VIII
Declaration and records named in the mandate	Authorised representative	Ten years after placing on the market or putting into service	Article 40(3)(a)
Copy of the declaration and access to technical documents	Importer	Ten years after placing on the market	Article 41(7)
Identity of the immediate supplier	Economic operator	Ten years after receipt	Article 46(1)–(2)
Identity of the recipient, quantity and exact models	Economic operator	Ten years after supply	Article 46(1)–(2)

The modules have different retention triggers: Module A measures from placing on the market of the last battery of the model, and Module G uses records specific to the unit. Article 38(4) refers to technical documentation in Annex IX, although Annex VIII contains it. Retention policies should satisfy the selected module and verify the current text (OQ-REG-008).

3.9 Corrective action, withdrawal and recall

Manufacturers and importers that believe a battery they placed on the market is non-compliant must immediately correct, withdraw or recall it, as appropriate. If it presents a risk, they immediately inform the relevant authority, with details of the non-compliance and the action taken. Distributors ensure that appropriate action is taken and give a similar notification. A distributor or importer that believes a battery is non-compliant must not make it available or place it on the market until conformity is restored (Articles 38(9)–(10), 41(5)–(6) and (8), 42(3), (5)–(6) and 43).

Authorities may require correction, withdrawal or recall, and action extends to the affected batteries the operator made available throughout the Union. Measures can also apply to a compliant battery that presents a risk. Formal defects, including absent or improper CE marking, declaration or documentation, or missing manufacturer or importer details, must be corrected (Articles 79, 81 and 83). GS1 identifiers help locate the affected parties, models, batches or instances (chapter 12). They do not determine the remedy or prove conformity.

3.10 How GS1 standards identify parties and locations

The Regulation requires party, contact and supply-chain identity information but does not prescribe GS1 standards. GLN identifies economic operators, functions and locations, so that the same party is recognised in every record. The associated data holds the name, address and contact details; a GLN does not itself communicate them.

Object	How GLN is used	Level
Economic operator	Identifies the legal entity or party in master and transaction data	Party or legal entity
Conformity, quality or recall department	Identifies the function separately	Function
Manufacturing, storage, testing or	Identifies the location or sub-location	Location or sub-location

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Object	How GLN is used	Level
dispatch site		

A GLN does not determine an operator's role and does not replace an authority-issued identifier. Technical basis: GS1 GLN Allocation Rules Standard, sections 2.1–2.3.

4 Physical labels and QR-accessible information

Physical labels, CE marking, the QR code and the information behind it are separate mechanisms, each with its own scope and date. A QR code is a data carrier, not a battery passport, and it does not replace physical markings or CE marking. The manufacturer ensures Article 13 labelling (Article 38(1)); importers and distributors verify it (Articles 41(2) and 42(2)).

4.1 Physical labels and markings

Mechanism	What it covers	Date or trigger	Provision
General label	Annex VI, Part A information, described below	18 August 2026 or 18 months after the Article 13(10) implementing act enters into force, whichever is later (OQ-REG-001)	Article 13(1), (7), (10); Annex VI, Part A
Separate-collection symbol	All industrial batteries. The symbol has a minimum size and a packaging alternative for very small batteries	18 August 2025	Article 13(4), (7); Annex VI, Part B
Cd or Pb symbol	Batteries containing more than 0.002% cadmium or 0.004% lead, printed beneath the collection symbol	Transition to be confirmed (OQ-REG-002)	Article 13(5), (7)
Carbon-footprint label	Rechargeable industrial batteries above 2 kWh: the carbon footprint and performance class	The conditional date in Article 7(2) (chapter 14)	Article 7(2)

The general label includes manufacturer identity; battery category and Article 38(6) identification; place and date of manufacture; weight; capacity; chemistry; hazardous substances other than mercury, cadmium or lead; usable extinguishing agent; and critical raw materials above 0.1% by weight (Annex VI, Part A). Article 38(6) requires model identification with a batch or serial number, product number or another identifying element. It does not universally require serialisation.

4.2 Placement

The labels and the QR code must be printed or engraved visibly, legibly and indelibly on the battery. Where this is not possible or not warranted because of the nature and size of the battery, they are affixed to the packaging and to the accompanying documents (Article 13(7)). The QR code must be in high contrast and of a size readable by a commonly available reader (Annex VI, Part C).

4.3 Physical CE marking

CE marking and QR access are separate. CE marking is affixed under Articles 19–20 (chapter 3). The QR code gives access to the declaration of conformity under Article 13(6)(b) at or below 2 kWh; above 2 kWh the declaration is public passport information under Annex XIII, point 1(r). Neither replaces the other.

4.4 The QR code requirement

From 18 February 2027 all batteries must bear a QR code (Article 13(6)). For industrial batteries, the route depends on capacity.

Industrial-battery capacity	Battery passport	QR code route
Greater than 2 kWh	Required	Article 13(6)(a): access to the passport

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Industrial-battery capacity	Battery passport	QR code route
Exactly 2 kWh or less	Not required under Article 77(1)	Article 13(6)(b): access to the information below
Not established	Further capacity information is needed before choosing the route	None can be chosen yet

4.5 QR information at 2 kWh or less

The Regulation requires this information to be complete, up to date and accurate (Article 13(6)). It does not prescribe the identification level behind the QR code.

Information	What it means	Provision
Applicable labels and markings under Article 13(1)–(5)	The general label, capacity or duration information and the symbols	Article 13(6)(b)
EU declaration of conformity	The declaration covering the battery	Articles 13(6)(b) and 18
Report on the battery due-diligence policy	The Article 52(3) report, where the operator or battery is within Chapter VII of the Regulation (chapter 8). Where no report exists, the Regulation does not state how the reference is handled, and no reporting duty should be invented (OQ-REG-003)	Articles 13(6)(b) and 52(3)
Waste prevention and management information	The complete Article 74(1)(a)–(f) set (chapter 10), not an abbreviated recycling statement	Articles 13(6)(b) and 74(1)

4.6 Battery passport content and access

From 18 February 2027, each industrial battery with a capacity greater than 2 kWh placed on the market or put into service has a battery passport (Article 77(1)). The passport holds information about the battery model and about the individual battery, including information resulting from its use. Each item applies to the extent that it is applicable to the battery category or sub-category concerned (Article 77(2)).

Annex XIII sets four sets of information, each with its own access rights:

Annex XIII point	Level	Who has access	Information
Point 1	Battery model	General public	Annex VI, Part A information; material composition, including chemistry, hazardous substances other than mercury, cadmium or lead, and critical raw materials; carbon-footprint information under Article 7(1) and (2); responsible-sourcing information from the Article 52(3) report; recovered-material information under Article 8(1); share of renewable content; rated capacity in Ah; minimal, nominal and maximum voltage; original power capability and limits; expected lifetime in cycles and the reference test; temperature range when not in use; period of the commercial warranty for calendar life; initial round-trip energy efficiency and at 50% of cycle life; internal cell and pack resistance; c-rate of the relevant cycle-life test; Article 13(4) and (5) markings; EU declaration of conformity; and Article 74(1)(a)–(f) information
Point 2	Battery model	Persons with a legitimate interest, the Commission, notified bodies and market surveillance authorities	Detailed composition, including materials in the cathode, anode and electrolyte; part numbers for components and contact details of sources for replacement spares; dismantling information; and safety measures
Point 3	Battery model	Notified bodies, market surveillance authorities and the Commission	Results of test reports proving compliance
Point 4	Individual battery	Persons with a legitimate interest	Article 10(1) performance and durability values when placed on the market and when its status changes; state of health under Article 14; status (“original”, “repurposed”, “re-used”, “remanufactured” or “waste”); and data from its use, including charging and discharging cycles, negative events such as accidents, and periodically recorded operating conditions and

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Annex XIII point	Level	Who has access	Information
			state of charge

Source: Article 77(2), second subparagraph; Annex XIII, points 1–4.

Legitimate-interest access serves two purposes. The first is dismantling and detailed model composition, where essential for repairers, remanufacturers, second-life operators and recyclers to conduct their activities. The second, for individual batteries, is where essential for the purchaser, or parties acting for the purchaser, to make the battery available to independent energy aggregators or energy market participants (Article 77(2), third subparagraph). Article 77(9) requires implementing acts specifying these persons and their access, due by 18 August 2026. No adopted act was found when this guideline was written (OQ-REG-017).

Not every item exists for every battery from 18 February 2027. Items in point 1 follow their underlying provisions: carbon-footprint information follows the Article 7 dates, recovered-material information the Article 8 dates, and the due-diligence report the Article 47 scope and the Article 48(1) date (chapter 14). State-of-health information in point 4 applies only where Article 14 applies, which for industrial batteries means stationary battery energy storage systems, not every industrial battery above 2 kWh. The Commission's guidance on passport data points (version 3.2, October 2026) is an aid and does not replace these provisions. Chapter 15 lists the data attribute by attribute.

4.7 Responsibility for the passport

The economic operator placing the battery on the market attributes the unique identifier and ensures that the passport information is accurate, complete and up to date. It may give another operator written authorisation to act on its behalf (Article 77(3)–(4)). Data is stored by the responsible operator or by operators it authorises, and those operators may not sell, re-use or process the data beyond what is necessary for the storing or processing service (Article 78(c)–(d)).

Responsibility changes at two points. After a circular operation, it moves to the operator placing the resulting battery on the market or putting it into service, and that battery has a new passport linked to the passport or passports of the original battery or batteries (Article 77(7), first subparagraph). When the battery becomes waste, it moves to the producer, the appointed producer responsibility organisation or the waste management operator selected under Article 57(8) (Article 77(7), second subparagraph). The passport ceases to exist after the battery has been recycled (Article 77(8)).

4.8 Data format, access rights and continuity

Passport information is based on open standards and is in an interoperable format, transferable through an open interoperable data exchange network without vendor lock-in, machine-readable, structured and searchable (Article 77(5)). Article 78 adds the following requirements:

Requirement	Effect	Provision
Interoperability	Fully interoperable with other digital product passports required by Union law on eco-design, in technical, semantic and organisational aspects	Article 78(a)
Free access	Consumers, economic operators and other relevant actors have access free of charge, according to their access rights	Article 78(b)
Continuity	The passport remains available after the responsible operator ceases to exist or ceases its activity in the Union	Article 78(e)
Restricted changes	Rights to access, introduce, modify or update information follow Annex XIII and the Article 77(9) acts	Article 78(f)
Data quality and security	Data authentication, reliability and integrity are ensured, with a high level of security and privacy, and fraud is avoided	Article 78(g)–(h)

4.9 Registering the unique identifier

The economic operator placing the battery on the market or putting it into service uploads the unique identifier to the registry established under Article 13(1) of Regulation (EU) 2024/1781 (Article 77(10)). This is separate from hosting the passport. Implementing Regulation (EU) 2026/1778, in force since 6 August

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2026, sets out the arrangements for the registry and expressly covers batteries under Article 77 (Article 1(1)(b)). The relevant actor registers the passport through the registry's secure user interface or its API, and the registry generates a unique and persistent registration identifier (Article 8(2), (6) and (8)). The full operational rules, and how a GS1 identifier is registered, need checking before deployment (OQ-REG-017).

4.10 Status change after a circular operation

A battery subjected to preparation for re-use, preparation for repurposing, repurposing or remanufacturing must bear new labels or markings with information on the change of status, accessible through the QR code (Article 13(9); Annex XIII, point 4). Above 2 kWh, the QR code gives access to the new passport. At or below 2 kWh there is no passport, and the exact information and granularity are unresolved (OQ-REG-007). See chapter 11.

4.11 How GS1 standards support the battery passport

The Regulation requires an individual passport, a unique identifier and QR access, but does not prescribe GS1 standards. This guideline proposes the following:

Requirement	GS1 application	Limitation
Identify each passport battery (Article 77(1) and (3))	GTIN plus serial number identifies the individual battery; GTIN identifies the battery trade item that holds shared model information	GTIN alone does not identify an individual battery
Give access through the QR code (Articles 13(6)(a) and 77(3))	A GS1 Digital Link URI encoded in the QR code connects the identified battery to its passport, described with link type `gs1:dpp` (chapter 7)	The URI and resolver are not the passport. The operator checks the complete implementation against Article 77(3), including ISO/IEC 15459-1 to 15459-6 or their equivalent. GS1 is an ISO/IEC 15459 conformant Issuing Agency (GS1 General Specifications, section 1.2.1)
Serve the different access levels (Annex XIII; Article 78(b) and (f))	A resolver connects one identity to several resources, and the information service applies the access controls	Selecting a link does not grant a right to read restricted information
Keep passport data current (Article 77(4))	GLN identifies parties and sites, and EPCIS captures lifecycle events that can feed passport records	EPCIS is not the passport and does not prove the data is correct

Chapter 7 explains how the access is implemented.

5 Batteries incorporated in products and service relationships

Incorporation does not take a battery out of the Regulation (Article 1(3)). A battery in or with another product remains a separate regulated object, and its category and capacity decide its passport outcome, not the product it is in.

5.1 Removal and replacement

Article 11 addresses portable and LMT batteries. It applies to a battery in this guideline only if that battery also falls within one of those categories, so classify the battery first (chapter 1).

5.2 Battery, host product and combined supply

The battery and the host product are separate identification and data objects. Where each is a trade item, the battery GTIN identifies the battery and a separate GTIN identifies the equipment or installation. Battery chemistry, capacity and mass describe the battery; host-product mass and performance describe the host. State clearly which object each attribute describes. If the battery is not managed as a trade item, assess the appropriate identification structure instead of assuming that the host GTIN identifies it.

Information need	Relationship to record	Boundary
Describe a product design	Host model linked to permitted battery models,	Compatibility with a battery model does not

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Information need	Relationship to record	Boundary
	quantities and specification versions	prove that a particular unit contains it
Identify production affected by a battery batch	Host production batch or instances linked to the installed battery GTIN and batch/lot number	If alternative batteries are used, the relationship has to distinguish the actual production concerned
Retrieve an installed battery's service history or individual passport	Identified host instance linked to the battery GTIN plus serial number	The host identity does not replace the individual battery identity
Record removal or replacement	End the previous installation relationship and record the new one, with its effective date and supporting service record	Do not overwrite the history as though the replacement battery had always been installed

These relationships give access to battery evidence from a host-product record. An EPCIS AssociationEvent records an association between an identified battery and its host, or the end of that association, for example during installation or removal, where the event semantics apply (GS1 EPCIS Standard, version 2.0.1, section 7.4.6, pp. 96–102). Any access route through the host supplements the battery's own QR and placement requirements and is no permission to omit the battery marking.

A battery supplied with, but not incorporated in, another product remains a separate object. Where each is a trade item, the battery and the host product each have a GTIN, and a combined retail or supply configuration requires its own GTIN under the applicable allocation rules. Maintain a record for the combined trade item, the host product and each battery trade item, with the quantity of each. A predefined assortment follows the GS1 allocation rules for its composition and changes (GS1 GTIN Management Standard, section 2.9, p. 17).

The battery mass used for reporting (chapter 9) is the mass of the battery, not of the combined product. A contents list does not identify individual batteries, and an outer commercial QR code does not automatically satisfy the battery QR placement rule.

5.3 How GS1 standards support service relationships

The Regulation requires battery identification but does not prescribe GS1 standards. GTIN plus serial number identifies an individual battery. Associated records link that battery to its host and retain its installation, service and replacement history where the operational need requires that detail. GLN identifies a party or service location. These records support retrieval and do not determine who is responsible for a duty.

6 Identification and data granularity

The Regulation requires batteries to be identified, but the level depends on the purpose. Manufacturers must provide model identification with a batch or serial number, product number or another identifying element, on the battery or, where its size or nature makes this impossible, on the packaging or accompanying document (Articles 38(6), 41(2)(d) and 42(2)(d)). The Regulation does not prescribe GS1 standards. This guideline proposes them because they identify each of these levels in an interoperable and globally unique way.

6.1 Identification levels

What is identified	GS1 identification	What it is for
Battery model or trade item	GTIN	Identifies the battery trade item linked to the model and its shared specification; associated master data holds the attributes
Production batch	GTIN plus batch/lot number	A group of identical items manufactured under uniform conditions. A batch/lot number without its GTIN is not sufficient
Individual battery	GTIN plus serial number	Each battery has its own identification. GTIN alone does not identify an individual battery
Product grouping, such as a pack	Its own GTIN where required	Every level of a trade item that is priced, ordered or invoiced has its own GTIN. It does not identify each contained battery

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What is identified	GS1 identification	What it is for
Logistic unit, such as a pallet	SSCC	One physical logistic unit. It does not identify a model, batch or battery and cannot serve as the battery's identifier; the contents have to be recorded
Party, function or location	GLN	Operators, departments and sites. It does not replace an authority-issued identifier

A battery is a trade item when it is a product for which predefined information needs to be retrieved and that may be priced, ordered or invoiced at a point in the supply chain. This can be a cell, module, battery pack or another configuration. Where a pack and a replaceable module are each traded separately, each has its own GTIN. Chapter 5 covers batteries in or with other products.

6.2 The level that fits industrial batteries

Above 2 kWh, each industrial battery requires an individual passport. GTIN plus serial number identifies that individual battery in the GS1 implementation, while the associated records retain the model and, where relevant, batch/lot relationships. At or below 2 kWh, Article 77 does not require a passport, and the information or operational need determines the identification level. For the applicable Article 7 and 8 records, GTIN identifies the battery trade item linked to the model, GLN identifies the manufacturing plant and production records retain the relevant year. GS1 identification does not determine the battery's legal category or capacity.

6.3 Working with model, batch and individual records

Level	How it is implemented	Limits
Model	Create a controlled relationship between the trade item and the regulatory model. Link documents and attributes to their source, owner, version and period of applicability, so that batch and individual records and web resources reuse them	Model data cannot distinguish one battery's history. A changed document does not necessarily require a new GTIN; retain the version that applies to batteries already supplied
Batch	Link the batch to its model and production documents. Keep batch-specific information with the batch, and preserve the batch identity through packing and supply, recording mixed batches separately	A batch record does not prove that every battery in it has a measured characteristic, unless the evidence supports that
Individual	Create the record before relying on the identifier downstream, link it to the model and batch, and preserve it in installation, supply and service records. Test that the physical identifier retrieves that individual battery and not only a general product page	Using a new service provider must not break the link between the identifier and its records

Select the combination that answers the actual information need. Do not apply a finer level without a regulatory or operational reason.

6.4 Keeping identifiers stable

The GTIN Management Standard describes which changes to an item require a new GTIN. The economic operator assesses the product change, the supply chain's need to distinguish it, the continued accuracy of model, batch and individual records, and the continuity of documents. Keep the GS1 identifier associated with the same battery or battery model, even if the information, service provider or website changes. Do not reassign it to another object.

Technical basis: GS1 General Specifications, release 26.0, sections 1.3.1–1.3.1.4, pp. 35–40, and 1.3.5.1, p. 56; GS1 GTIN Management Standard, release 1.1, sections 1–2, pp. 8–18.

7 Implementing QR access with GS1 Digital Link

The Regulation requires QR access but does not prescribe GS1 standards. This guideline proposes GS1 Digital Link, which provides a globally unique identifier and a stable entry point. Which information the address leads to depends on capacity: above 2 kWh, the individual battery passport (Article 13(6)(a)); at

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exactly 2 kWh or less, the Article 13(6)(b) information. Establish the capacity before choosing the route. A serialised information page is not a passport.

7.1 Building the GS1 Digital Link URI

For the battery trade items described here, a GS1 Digital Link URI represents the GTIN as a web address. A batch/lot number or serial number adds the identification detail needed for the linked information. The URI is constructed as follows:

1. Determine what is identified and at which level. Keep an incorporated or supplied battery distinct from its host product. Above 2 kWh, use GTIN plus serial number, because the passport is individual. At or below 2 kWh, use GTIN alone where the information is the same for the whole model, and add the batch/lot number where it varies by batch. This is this guideline's proposal, not a legal requirement.
2. Allocate a GTIN to the battery trade item. Above 2 kWh, add the serial number to identify the individual battery with a passport. At or below 2 kWh, add the batch/lot number or serial number where the information relates to that batch or individual battery.
3. Construct the URI following section 4 of the GS1 Digital Link URI Syntax standard.
4. Encode the URI in a QR code following GS1 rules, meeting Article 13(7) and Annex VI, Part C.
5. Direct requests to the information resources for the identified battery model, batch/lot or instance. Assign each resource an owner who checks that updates remain applicable to those batteries.
6. Keep the identifier associated with the same battery or model, even if the information, service provider, website or resolver changes.

The conceptual form is `https://example.com/01/{GTIN}/21/{SERIAL}` above 2 kWh, and `https://example.com/01/{GTIN}/10/{BATCH}` for a batch-level route at or below 2 kWh. `example.com` and the values in braces are placeholders, not production identifiers or allocation advice.

7.2 Route at or below 2 kWh

Resource to make accessible	How it is connected
Applicable information under Article 13(1)–(5)	Link the battery record to the relevant labelling information, using batch-specific data where the information varies
EU declaration of conformity under Article 18	Identify the declaration covering the battery and keep its applicability and version
Report under Article 52(3)	Link the applicable operator report to the batteries and reporting period it covers. Do not invent a reporting duty for an excluded operator (OQ-REG-003)
Waste-prevention and management information under Article 74(1)(a)–(f)	Provide the complete applicable set, including collection and safety information, rather than an abbreviated recycling statement

Article 13(6) requires the information to be complete, up to date and accurate. QR access does not replace physical markings or CE marking under Articles 19–20. What has to be accessible after a circular operation needs further assessment (OQ-REG-007).

7.3 Route above 2 kWh

The passport remains a separately governed electronic record. The operator validates the whole implementation against Article 77(3), including ISO/IEC 15459-1 to 15459-6 or their equivalent; a syntactically valid URI alone is not sufficient. The table shows logical relationships, not a required database architecture.

Implementation task	Practical arrangement	Provision
Establish identity and record	Associate the physical battery, unique identifier and individual passport, and link the applicable model information	Article 77(1)–(3)
Allocate data responsibility	Name the source and maintaining actor for each field, including information supplied by other parties	Article 77(4)

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Implementation task	Practical arrangement	Provision
Support information exchange	Keep structured data and relationships in an interoperable, machine-readable, searchable and transferable form	Articles 77(5) and 78(a)
Enforce access rights	Separate public information from restricted content, and control reading and updating according to the applicable entitlements	Articles 77(2), (6) and 78(b), (f)–(h); Annex XIII
Maintain continuity and lifecycle relationships	Provide continuity arrangements, transfer responsibilities at the specified points and link new passports to the original passports after circular operations	Articles 77(7) and 78(c)–(e)
Register the identifier	Upload the unique identifier to the Union registry, separately from hosting the passport	Article 77(10); Implementing Regulation (EU) 2026/1778
Handle recycling	Implement the rule that the passport ceases to exist after recycling, separately from any evidence retention required elsewhere	Article 77(8)

Using a service provider does not itself establish the required continuity, interoperability or security. Access entitlements under the Article 77(9) measures and interactions with other product passports need verifying before deployment (OQ-REG-017). A battery or host product can have a passport using an identifier other than a GS1 identifier; document such mappings without assuming that every connected passport uses GS1.

7.4 Resolvers and several audiences

Component	Function
QR code	Data carrier that encodes the URI, read by image scanners and mobile devices
GS1 Digital Link URI	Web-enabled identifier
Resolver	Service that connects a GS1 identifier to one or more sources of information about the identified item. Different organisations can operate one
Web resource	The human-readable page, or the data service, that the request reaches

A resolver is optional. A direct information page is also possible, and using a GS1 Digital Link URI does not imply using a conformant resolver. Where a GS1-conformant resolver is selected, describe resources with link types (next section) and metadata, configure the default route and test resolution at each supported level (GS1-Conformant Resolver Standard, release 1.2.1, sections 2.5–2.6 and 2.14). Maintain domain ownership, resource addresses and responsibility for updating links.

The same identity can lead to several resources. Selecting a resource and being authorised to read it are separate functions: selecting a repair-information link does not establish a right to read restricted information.

User or system	Resource	Control
Public reader	Public passport information above 2 kWh; the Article 13(6)(b) information at or below 2 kWh	A reliable public entry point for the identified battery
Repairer or recycler	Relevant technical or dismantling information	For restricted passport fields, verify entitlement under Article 77(2), Annex XIII and the applicable access measures. A stated occupation alone is not sufficient
Authority or notified body	Information within its regulatory access rights	Authenticate and authorise access at the relevant service, and keep the requested battery scope
Trading partner	Commercial documents or event records shared by agreement	Apply commercial access policies separately from public and passport access

Test that a request for an individual passport does not silently resolve only to model information.

7.5 Link types

A resolver describes each resource it links to with a link type from the GS1 Web Vocabulary. This guideline recommends the following link type for the QR route of industrial batteries:

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Batteries	QR route	Link type	Resource
Industrial batteries above 2 kWh	Article 13(6)(a)	`gs1:dpp` (Digital Product Passport)	The battery passport of the individual battery
Industrial batteries at 2 kWh or less	Article 13(6)(b)	`gs1:pip` (Product Information Page)	The page that gives access to the applicable information, declaration, report and waste information

Both are stable link types in GS1 Web Vocabulary version 1.18. `gs1:dpp` is defined as "a link to a digital product passport". `gs1:pip` is defined as "a link to information specifically about the identified item, typically operated by the brand owner or a retailer of the product and aimed at consumers".

The Regulation does not prescribe link types; this is a recommendation of this guideline. A link type describes a resource. It does not grant access to restricted passport information. Further resources can be given other link types.

The URI forms in this guideline cite GS1 Digital Link URI Syntax release 1.6.0, sections 4 and 5, pp. 19–37. GS1 has published release 1.7.0, ratified August 2026; assess it before finalising a technical specification.

8 Battery due diligence

Economic operators placing industrial batteries on the market or putting them into service fall within the battery due-diligence framework, subject to the turnover and circular-operation exclusions in Article 47. Whether a battery requires a passport under Article 77 does not determine whether these obligations apply. The application date and duties are set out below.

8.1 Who it applies to and from when

Chapter VII of the Regulation, on battery due diligence, applies to an economic operator that places batteries on the market or puts them into service, subject to Article 47. A covered operator must establish and implement a battery due-diligence policy addressing the raw materials and risks in Annex X and meet Articles 48–52, from 18 August 2027 (Article 48(1), as amended by Regulation (EU) 2025/1561).

Annex X lists cobalt, natural graphite, lithium, nickel and chemical compounds based on them that are necessary for manufacturing battery active materials. Its risk categories cover environment, climate and human health; human rights, labour rights and industrial relations; and community life, including that of indigenous peoples (Annex X, points 1–2). Article 48(8) permits amendments, so check the applicable delegated acts.

Two exclusions apply (Article 47):

- **Turnover.** An operator is excluded only where both elements are met: it had net turnover below EUR 40 million in the financial year preceding the last financial year, and it is not part of a parent-and-subsidiary group whose consolidated turnover exceeds EUR 40 million. Retain evidence for both.
- **Circular operations.** Chapter VII of the Regulation does not apply to batteries subjected to preparation for re-use, preparation for repurposing, repurposing or remanufacturing that had already been placed on the market or put into service before that operation. This covers those batteries only, not the operator's other activities.

8.2 What a covered operator has to do

Duty	What it means	Provision
Policy	Adopt and clearly communicate to suppliers and the public a policy on the Annex X raw materials and risks, consistent with the instruments in Annex X, point 4	Article 49(1)(a)–(b)
Management system	Support the policy, assign oversight to top management and keep records for at least ten years	Article 49(1)(c)
Supply-chain controls	Operate controls and transparency, including a chain-of-custody or traceability system identifying upstream actors	Article 49(1)(d)
Supplier contracts	Incorporate the policy and risk-management measures into contracts and	Article 49(1)(e)

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Duty	What it means	Provision
	agreements	
Grievance mechanism	Establish grievance, early-warning and remediation mechanisms, directly or through permitted arrangements	Article 49(1)(f)
Risk assessment	Identify and assess adverse-impact risks against the policy and the Annex X categories, and report findings to top management	Article 50(1), (3) and (4)
Risk mitigation	Adopt a strategy to prevent and mitigate impacts, monitor it, and consider suspending or ending supplier engagement after failed mitigation. Consult suppliers and stakeholders where mitigation continues during trade	Article 50(1)(b) and (2)
Third-party verification	Have the policy verified and periodically audited by a notified body, which issues a report and, where the policy meets Articles 49, 50 and 52, an approval decision	Articles 48(2) and 51
Annual public report	Publish, including online, a report that end-users can readily understand, clearly identifies the batteries concerned, describes the steps taken and significant impacts, and summarises verification, including the notified body's name. Where the operator demonstrates recycled sources, disclose its conclusions in reasonable detail	Article 52(3)–(4)

Article 48(4) permits collaboration, including through schemes recognised under Article 53, without removing individual responsibility. Participation in an industry scheme should not be described as equivalent unless the Commission's recognition applies.

The operator documents the following for each raw material (Article 49(2)): description, trade name and type; the immediate supplier's name and address; country of origin and transactions from extraction to the immediate supplier; quantity in the battery, as a percentage or weight; applicable third-party verification reports; and, where the conditions of Article 49(2)(f) are met, additional information on materials from conflict-affected or high-risk areas.

Management-system records are kept for at least ten years (Article 49(1)(c)). Documentation showing fulfilment of Articles 49, 50 and 52, including the verification report, approval decision and audit reports, is kept for ten years after the last battery manufactured under the relevant policy is placed on the market (Article 48(3)). This second trigger requires a durable link between the policy version and the batteries manufactured under it.

8.3 How GS1 standards support implementation

The Regulation requires supply-chain controls, identification of upstream actors and a report that clearly identifies the batteries, but does not prescribe GS1 standards (Articles 49(1)(d), 49(2) and 52(3)). This guideline proposes the following:

Requirement	GS1 application	Limitations
Identify the raw material	Where the material is a trade item, GTIN identifies the material class and GTIN plus batch/lot number identifies a material batch/lot. Master data holds the trade name and type	A GTIN does not itself communicate these attributes
Identify the immediate supplier	GLN identifies the supplier legal entity or function, and separate GLNs identify physical locations. The GLN Data Model associates organisation, address and contact information	Keep the supplier distinct from extraction, processing and dispatch locations. GLN complements the required name and address
Document origin and transactions	GTIN with batch/lot identification distinguishes the material flow, EPCIS shares events involving the material, actors and locations, and transaction records hold the commercial transactions	An EPCIS event or GLN does not establish legal origin. Record the country of origin explicitly, with evidence
Relate material quantity to production	An EPCIS TransformationEvent associates identified material inputs and their quantities with identified battery outputs	EPCIS keeps the input-to-output relationship but does not calculate or verify the quantity. The level depends on whether composition varies by model, recipe, batch/lot or battery
Associate verification reports	Reports are linked to GLNs for the supplier, notified body and sites, and to GTINs for the battery trade	Retrieval does not replace risk assessment, mitigation, verification or audit

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Requirement	GS1 application	Limitations
	items covered	
Handle conflict-affected or high-risk areas	GLNs identify upstream actors and locations, GTIN with batch/lot identification distinguishes the affected flow, and EPCIS records movements and custody	GS1 identifiers do not determine whether an area is conflict-affected or high-risk
Relate policies and reports to batteries	GTIN identifies each battery model or configuration. Governed records associate it with the policy, reporting period and report version. A GS1 Digital Link URI connects an identified battery to the published report	The link does not expand the report's scope and must not expose confidential evidence
Keep provenance where evidence varies	GTIN plus batch/lot number, or GTIN plus serial number where the battery is already individually identified, is linked to material batches/lots, suppliers and evidence	Model level is inadequate where origin, supplier or material lot differs. Chapter VII of the Regulation creates no universal serialisation duty

An operator can then follow a battery record back to the relevant supplier and evidence, or identify production affected by a supplier issue. Every raw-material unit does not need to be serialised, and confidential evidence does not belong in a public QR resource. Design the events from the needs of Articles 49–50, and protect confidential and personal information. EPCIS does not prove responsible sourcing, validate documents, perform risk assessment or replace notified-body verification.

Article 52(3) prescribes neither an identifier nor whether one report covers one or several models. A report link should define the reporting operator and period, identify each model or justified grouping, associate the applicable policy and verification summary, publish stable version and status information, and keep relationships when a GTIN, supplier, formulation, policy or report changes. Where evidence varies by batch, a model-level presentation must not imply uniform provenance.

Article 13(6)(b) refers to the Article 52(3) report, but Article 47 can exclude the operator or battery. How the QR code handles this is unresolved (OQ-REG-003; chapter 4). This concerns batteries at or below 2 kWh.

Technical basis: GS1 General Specifications, sections 1.3.1, 1.3.1.2, 1.3.1.4, 1.3.3 and 1.3.4, pp. 35–53; GS1 GLN Allocation Rules Standard, sections 2.1.1–2.1.2, p. 10; GS1 EPCIS Standard, version 2.0.1, sections 7.4.5–7.4.6, pp. 93–102.

9 Producer registration, EPR and market reporting

Producer registration and extended producer responsibility (EPR) apply to industrial batteries, including those incorporated in appliances, light means of transport or other vehicles. They do not depend on the battery passport. The decisive questions are who first makes the battery available in a Member State, how it is supplied, and whether an authorised representative for EPR or a producer responsibility organisation acts for the producer (Article 3(1), points (47)–(49); Articles 55–58).

9.1 Who the producer is

"Producer" is a role determined separately for each Member State. It is not necessarily the manufacturer named on the battery. Article 3(1), point (47), covers a person that, irrespective of the selling technique used, including distance contracts:

- is established in a Member State and supplies, for the first time in that Member State, batteries manufactured under its own name or trade mark;
- is established in a Member State and resells, for the first time in that Member State and under its own name or trade mark, batteries manufactured by another party, whose name or trade mark does not appear on the batteries;
- is established in a Member State and supplies, for the first time in that Member State and on a professional basis, batteries from another Member State or a third country; or
- is established in another Member State or a third country and sells batteries by distance contract directly to end-users in the Member State concerned.

A party can be the producer in one Member State without being the producer for the same battery in another. Maintain the determination and its evidence for each combination of legal entity, Member State

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and supply route. An operator that first makes available a battery resulting from a listed circular operation is the producer of that battery (Article 56(2)).

9.2 Registration

A producer must apply electronically in every Member State where it first makes an industrial battery available, and may supply there only if it, or its EPR authorised representative, is registered (Article 55(1)–(2)). Before making a battery available, a distributor verifies that the producer is registered (Article 42(2)(a)).

The application includes the producer's name, brand names, address and contact details; its national identification code, trade-register or equivalent official number and tax identification number; each relevant battery category and chemistry; information on the EPR, collection and data-reliability arrangements and any appointed producer responsibility organisation; and a statement that the information is true (Article 55(3)). EPR and collection information can instead be supplied through the Article 58 authorisation application. Member States may combine registration and authorisation, request additional documents, set procedures and charge proportionate fees.

Once the application is complete, the competent authority grants registration and provides a registration number within no more than 12 weeks (Article 55(9)(b)). The authority may refuse or withdraw registration where required information or evidence is absent or insufficient or the producer no longer meets the EPR requirements, and must withdraw it where the producer has ceased to exist (Article 55(11)). The producer must notify the competent authority without undue delay of any change to the registration information and of the permanent end of making the registered batteries available in that Member State (Article 55(12)). Check current status, and do not treat possession of a number as permanent proof of compliance.

9.3 Producer responsibility and costs

A producer may appoint an authorised producer responsibility organisation (PRO) to fulfil EPR on its behalf, and a Member State may make this mandatory where justified (Article 57(1)). Contributions to a PRO are modulated at least by category and chemistry (Article 57(2)). A producer fulfilling EPR individually, or a PRO fulfilling it collectively, must obtain authorisation and provide the required guarantee (Article 58).

Costs the producer covers	Provision
Separate collection and subsequent transport and treatment, accounting for specified revenues	Article 56(4)(a)
Compositional surveys of collected mixed municipal waste	Articles 56(4)(b) and 69(5)
Information on prevention and management of waste batteries	Articles 56(4)(c) and 74
Data gathering and reporting to competent authorities	Articles 56(4)(d) and 75

These costs are shown separately to the end-user at the point of sale of a new battery (Article 74(5)). For a battery that has undergone a listed circular operation, the original and subsequent producers may establish a cost-sharing mechanism (Article 56(5)).

9.4 Online sales and platforms

A producer selling directly by distance contract to end-users in a Member State from another Member State or a third country must appoint, by written mandate, an EPR authorised representative in every Member State of sale (Article 3(1), points (47)(d) and (48); Article 56(3)).

Online platforms within Section 4 of Chapter III of Regulation (EU) 2022/2065 (the Digital Services Act) that allow consumers to conclude distance contracts with producers must obtain the relevant producer register and registration number or numbers, plus the producer's self-certification that it offers only batteries meeting the specified EPR requirements (Article 62(6)). If registration information is not public, Member States give qualifying platforms free access (Article 55(13)). Another identifier may be an internal lookup key but does not satisfy Article 62(6), and self-certification is not independent verification.

9.5 Reporting quantities

Producers or, where appointed, PROs report annually to the competent authority by category and chemistry, including batteries incorporated in vehicles and appliances. The report covers the amount first

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made available and the collected amounts delivered for preparation for re-use or repurposing, delivered for treatment, or exported for those operations or treatment (Article 75(2), (4)).

Reporting is territorial: batteries that leave the Member State in the same year before sale to end-users are excluded from the amount first made available. Reports are due within six months after the reporting year. The first reporting year is 2026, with reports due by 30 June 2027. This is calculated from Article 75(7) and Article 2 of Implementing Regulation (EU) 2025/2289, which entered into force on 11 December 2025.

Article 1 of that implementing act sets the format Member States use to report to the Commission and does not directly address operators. Operators report in the format set by the competent authorities of each Member State where they have reporting duties (Article 75(8)), so check the current requirements of those authorities or of the PRO. The Commission format is still useful for planning, because it shows the data Member States have to supply (Article 76(1); Implementing Regulation (EU) 2025/2289, Annexes I to III).

9.6 How GS1 standards support registration and reporting

The Regulation requires official identity information, an authority-issued number and category-, chemistry- and weight-based reporting. It does not prescribe GS1 standards. This guideline proposes the following:

Requirement	GS1 application	Limitations
Keep the registration number issued in each Member State (Article 55(9)(b))	GLN identifies the registered producer legal entity or function. The registration record links that GLN to the authority-issued number, Member State, competent authority, status and effective dates, so that the relevant registration information is retrievable	GLN complements the authority-issued registration number. Having a GLN does not demonstrate registration or EPR compliance. One producer can hold several national registration numbers
Identify the producer (Article 55(3)(a)–(b))	GLN identifies the producer legal entity or function, with associated name, address, contact details and official identifiers	Keep the issuing jurisdiction and identifier type of each official identifier
Distinguish collection, return, warehouse or reporting locations	Separate GLNs identify locations and functions	A location GLN does not identify the registered producer and does not replace a permit
Report by category, chemistry and weight (Article 75)	GTIN identifies the battery trade item, so that quantities aggregate consistently. Associated data holds the category, chemistry, unit weight, incorporation status and responsible producer per Member State	A GTIN does not encode this data. GS1 standards do not determine producer status, calculate liability or replace authority formats

The reporting process uses the identified batteries and their associated records as follows:

1. Identify the responsible producer and Member State for the activity.
2. Retrieve the battery data for the supplied model and period.
3. Derive battery quantities from direct sales or recorded host and bundle contents, keeping the source calculation.
4. Capture returns, corrections and movements out of the Member State before sale to end-users.
5. Aggregate into the prescribed category, chemistry and weight measures, with links back to source records.

A shipment is not necessarily a first making available on a Member State market. A host-product sale must not count the same battery twice, and host mass must not replace battery mass. Where a battery is incorporated in or supplied with another product, the host-product GTIN and the battery GTIN remain separate, linked data. GDSN supports this exchange only where the attributes, validations and target-market implementations have been verified. Technical basis: GS1 General Specifications, sections 1.3.1 and 1.3.3–1.3.5.1, pp. 35–36 and 49–56; GS1 GLN Allocation Rules Standard.

9.7 What to confirm in each Member State

- the competent authority, register and electronic application route;
- whether registration and authorisation are combined, and whether appointing a PRO is mandatory for the category;

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- additional documents, procedures, fees and language requirements;
- how distributors and online platforms verify current registration;
- collection-system, guarantee, contribution and enforcement arrangements;
- reporting taxonomy, electronic format, validation rules and correction process; and
- national measures for matters that Chapter VIII of the Regulation does not fully harmonise.

10 Collection, treatment and recycling

These rules apply to waste industrial batteries, whether or not a battery passport applied.

10.1 Collection and take-back

Producers or appointed producer responsibility organisations (PROs) must take back all waste industrial batteries of the category they made available, free of charge and without requiring a new purchase, throughout the territory and irrespective of capacity. Where prior dismantling is required at the premises of private, non-commercial users, those users do not bear the dismantling and collection costs (Article 61(1)–(4)).

Distributors must take back qualifying waste batteries free of charge and without requiring a new purchase, at or in the vicinity of the retail outlet. The duty is limited to categories they offer or have offered and does not apply to waste products containing batteries (Article 62(1)–(2)). They hand the batteries to the responsible producer or PRO or to a selected waste management operator (Article 62(3)). Distance-selling distributors provide sufficient collection points, and for sales with delivery they offer free take-back and inform the end-user when ordering (Article 62(4)–(5)). End-users discard waste batteries separately from other waste (Article 64).

Article 61 sets no percentage collection target for industrial batteries.

10.2 End-user and operator information

For the battery categories they supply in a Member State, producers or appointed PROs must make available to end-users and distributors information on (Article 74(1)(a)–(f)):

- the role of end-users in waste prevention and in separate collection;
- good practices for extending use, and the possibilities of re-use, preparation for re-use, preparation for repurposing, repurposing and remanufacturing;
- available collection, take-back, preparation and treatment;
- safety instructions for handling waste batteries, including lithium risks;
- the meaning of labels and symbols; and
- the impact of substances, including from inappropriate discarding.

They provide it at regular intervals for each battery model from first making available in the Member State, at least visibly at the point of sale and through online platforms, in a language or languages set by the Member State that end-users easily understand. Distributors supplying end-users provide it permanently in their premises, easily accessible and clearly visible, with information on returning waste batteries free of charge, also when selling through online platforms (Article 74(4)). Producers or PROs conduct awareness campaigns and offer incentives to encourage correct discarding (Article 74(6)). Commercially sensitive information stays confidential (Article 74(7)).

Producers also give distributors and waste operators information on safety and protective measures for storage and collection. They give operators carrying out preparation or treatment model-specific dismantling and safety information, including components, materials and hazardous-substance locations, electronically, free of charge and on request (Article 74(2)–(3)).

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10.3 Storage, transport, handover and treatment

Collection infrastructure has to suit the expected volume and hazardous nature of the batteries. At treatment facilities, impermeable surfaces and weatherproof covering or suitable containers are required, and batteries must not be mixed with conductive or combustible waste. Lithium-based batteries require heat, water, damage, orientation, ventilation, isolation and warning controls (Annex XII, Part A, points 2–4).

Operators of treatment facilities for end-of-life vehicles and waste electrical and electronic equipment (WEEE) hand removed batteries to the relevant producer, PRO or selected waste operator and keep transaction records (Article 65). What these records contain beyond what is expressly listed is open (OQ-REG-014). An operational record normally holds date, source, destination, parties, category, chemistry, measured quantity, logistic-unit reference and intended operation; these are implementation data, not additional legal requirements.

Separately collected batteries must undergo treatment and must not be disposed of or sent to energy recovery. Treatment takes place in a permitted facility, complies with Annex XII, Part A, and uses best available techniques under Directive 2010/75/EU. Batteries are also removed from WEEE, end-of-life vehicles and other waste products during treatment (Articles 70–71; Annex XII, Part A).

10.4 Recycling targets and documentation

Each permitted facility ensures that all waste batteries made available to it are accepted and undergo preparation for re-use, preparation for repurposing or recycling (Article 71(1)). Recyclers must achieve these targets (Article 71(2)–(3); Annex XII, Parts B and C):

Date	Target by material
Efficiency by 31 December 2025	Lead-acid 75%; lithium-based 65%; nickel-cadmium 80%; other 50% by average weight
Recovery by 31 December 2027	Cobalt, copper, lead and nickel 90% each; lithium 50%
Efficiency by 31 December 2030	Lead-acid 80%; lithium-based 70% by average weight
Recovery by 31 December 2031	Cobalt, copper, lead and nickel 95% each; lithium 80%

The Commission had to assess by 18 August 2026, and must assess at least every five years after that, whether to revise these targets, and it may amend them by delegated act (Article 71(5)). Check whether that assessment has changed the targets before configuring them.

Delegated Regulation (EU) 2025/606, in force since 24 July 2025, sets the calculation, verification and documentation rules (Article 71(4)):

Subject	What the Annex requires	Annex section
Recycling efficiency	Output fractions as a mass percentage of input fractions per calendar year, separately for lead-acid, lithium-based, nickel-cadmium and other batteries. Emissions do not count. Until 31 December 2029, oxygen, carbon and iron from cell-level sources, phosphorus, chlorine and sulphur may be counted. From 1 January 2030, carbon and iron from cell-level sources and phosphorus shall be counted, while oxygen, chlorine and sulphur may be	1 and 2
Input composition	The share of each chemistry by sorting analysis. Overall composition from producer information held in an electronic record, such as the battery passport, or from analysis of outputs, emissions and waste, or by sampling the input	2
Material recovery	For cobalt, copper, lead, lithium and nickel, the mass in output fractions at the recovery calculation point as a percentage of the mass in input fractions. Black mass is an intermediate fraction, not an output fraction	1 and 3
Mercury and cadmium	Input amounts and amounts safely immobilised and disposed of, and for cadmium also the amount in recycled output fractions	4
Documentation	Data every year, by Member State of collection, to the competent authorities of the Member State of treatment, electronically, using the template for each chemistry. Where several permitted facilities are involved, the first recycler collects and provides the information	1, 5–9 and 10
Verification	The competent authority of the Member State of treatment verifies the calculations every calendar year and, for recycling outside the EU, the evidence of equivalent conditions. It may request evidence and audit	10

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10.5 Shipments of used and waste batteries

Waste batteries or their fractions may be treated outside the Member State concerned or outside the Union, provided that the shipment complies with Regulations (EC) No 1013/2006 and (EC) No 1418/2007 (Article 72(1)). Check the shipment rules that currently apply before relying on these references (OQ-REG-020).

Waste exported from the Union counts towards the obligations, efficiencies and targets in Articles 70 and 71 only if the exporter provides documentary evidence, approved by the competent authority of destination, that treatment took place in conditions equivalent to those required by the Regulation and in accordance with other Union law on human health and environmental protection (Article 72(3)). The Commission is empowered to set criteria for assessing equivalent conditions by delegated act (Article 72(4)).

Competent authorities may inspect shipments of used batteries suspected to be waste, and the costs may be charged to the producers of the relevant category, third parties acting for them or other persons arranging the shipment, where the shipment turns out to consist of waste (Article 72(2)). A holder claiming to ship used batteries, not waste batteries, has to have the following available (Annex XIV, points 1, 3 and 4):

What the holder needs	Content
Invoice and contract	A copy of the invoice and contract for the sale or transfer of ownership, stating that the batteries are destined for direct re-use and are fully functional
Evidence of testing	Copies of the records, such as the certificate of testing, proof of functionality for every battery or fraction in the consignment, and the protocol with the record below
Declaration	A declaration by the holder that nothing in the consignment is waste under Article 3, point (1), of Directive 2008/98/EC
Protection	Appropriate protection against damage during transport, loading and unloading, in particular sufficient packaging and appropriate stacking
Testing	A test of the state of health and an evaluation of the presence of hazardous substances, with the results recorded
Record on the battery or packaging	Fixed securely but not permanently, on the unpacked battery or on the packaging so that it can be read without removing the packaging. It states the name of the battery or fraction, its identification number where applicable, the year of production if available, the name and address of the company testing the state of health, the types of test, and the results with their date
With every load	A relevant transport document and a declaration of responsibility by the person liable

The invoice, testing evidence and testing and record steps do not apply where documentary proof shows a business-to-business transfer agreement under which the used battery is sent back to the producer or a third party acting for it for repair under warranty with the intention of re-use. They also do not apply where a battery for professional use is sent for refurbishment or repair under a valid contract, or where it is defective and is sent for root cause analysis, under the conditions in Annex XIV, point 2. Without the required proof and protection, the object is considered waste and the load is presumed to be an illegal shipment (Annex XIV, point 5). The Commission may supplement these requirements by delegated act, in particular on the state of health (Article 72(2)).

Article 73 separately sets the evidence that a waste battery prepared for re-use or repurposing is no longer waste (chapter 11).

10.6 Reporting by operators

Reporter	Minimum scope	Provision
Producers or PROs	Market quantities and collected quantities sent to preparation, treatment or export (chapter 9)	Article 75(2)
Other collecting waste operators	Applicable collection and destination quantities	Article 75(3)
Treatment operators and recyclers	Received and processed quantities; efficiency; recovery; output destinations and yields	Article 75(5)
Other waste holders exporting for treatment	Exported quantities and applicable treatment data	Article 75(6)

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The first reporting year is 2026, with reports due by 30 June 2027 (chapter 9). In multi-facility recycling, the first recycler collects and reports the information. Data provided under Delegated Regulation (EU) 2025/606 may also be considered for Article 75(5) (Annex, section 5, point 1).

10.7 How GS1 standards support collection, treatment, reporting and shipment of waste batteries

10.7.1 How GS1 standards support waste records

The Regulation and the delegated act do not prescribe GS1 standards. This guideline proposes the following for the source records:

Need	GS1 application	Limitations
Identify the battery model in a waste record	GTIN identifies the battery model or trade item, and associated data holds category, chemistry and other attributes	Keep the battery identifier distinct from the host-product identifier
Distinguish a batch	GTIN plus batch/lot number identifies the batch	Chapter VIII of the Regulation does not require every waste battery to keep batch identity
Keep individual identity	GTIN plus serial number identifies the battery where that identity remains available	Universal serialisation is not needed. An unreadable serial number must not be reconstructed or inferred
Identify parties and locations	GLN identifies legal entities, functions and physical locations	A GLN complements a permit or other authority-issued identifier
Identify a pallet, cage, drum or container	SSCC identifies the logistic unit, and governed records hold its measured or declared contents	SSCC does not identify each battery inside or establish its contents
Record collection and treatment events	EPCIS ObjectEvent records observations and status changes, AggregationEvent associates objects with a logistic unit, and TransformationEvent captures the relationship between inputs and outputs. CBV provides terms such as collecting, decommissioning, disassembling and inspecting	EPCIS does not prove permitting, correct treatment or target achievement, and does not replace statutory reports, verification, audits or authority decisions

Define event ownership, granularity, aggregation, measurement, corrections, access, confidentiality, retention and reconciliation with the Article 75 totals. Record measured quantities instead of inferring them from identifiers, and distinguish net battery mass from container mass.

10.7.2 Data for the recycling documentation

First recyclers document recycling in the templates in sections 6 to 9 of the Annex to Delegated Regulation (EU) 2025/606. The mapping below is this guideline's own: no GS1 source maps these templates. Where no published GS1 term was found, the table says so and proposes none.

Template field	Published GS1 standard	Limitations
First recycler, each facility and further operator: name, address and country	GLN identifies the party or facility, and master data holds the name and address, including the country code	The template still requires these details written out, with a contact person
Calendar year	The EPCIS event time records when each event occurred	The recycler assigns events to the calendar year
Individual recycling steps	TransformationEvent captures the relationship between inputs and outputs, and the business location, identified by GLN, shows where the step took place	Inputs and outputs need identifiers for the event to link them. No published CBV business step for recycling was found; CBV provides the value "other"
Waste batteries entering recycling: mass	SSCC identifies the logistic unit received, AI (330n) expresses its logistic weight, and an EPCIS quantity expresses an amount identified at class level	Logistic weight is the gross weight of the whole unit. The template asks for the measured wet mass of the waste batteries
Waste batteries entering recycling: type and chemistry	GTIN identifies the battery trade item where it remains identifiable	Waste batteries are often mixed. No published GS1 Web Vocabulary term for battery

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Template field	Published GS1 standard	Limitations
		chemistry was found, and GDSN coverage has not been verified
European Waste Catalogue (EWC) code	The recycler records the applicable EWC code explicitly in the waste or consignment record and links it to the identified material or logistic unit.	No published GS1 field for this code was identified in the sources reviewed for this guideline. This record linkage is an implementation approach proposed by this guideline, not a GS1-standardised EWC attribute.
Member State of collection	An EPCIS source of type "location" carries the GLN of the collection location, and master data holds its country code	No published GS1 term for this concept was found. It is available only where collectors share these events and data
Intermediate and output fractions, including black mass	No published GS1 rule for identifying waste fractions was found	A TransformationEvent links only fractions that carry an identifier. Masses are measured and calculated by the recycler
Further operator, destination and yield	GLN identifies the further operator, and EPCIS shipping events record the handover	The recycler measures the yield
Rates, mercury and cadmium amounts, and verification	None. These are not GS1 functions	The first recycler calculates the rates, and the competent authority verifies them

Technical basis: GS1 General Specifications, sections 1.3.3, 3.3.1 and 3.6.3, p. 221; GS1 EPCIS Standard, sections 7.3.3.1, 7.3.4, 7.3.5, 7.3.6.4 and 7.4.5, pp. 54–55, 65 and 93; GS1 Core Business Vocabulary Standard, sections 7.1, 7.4 and 9.3, pp. 54 and 117.

10.7.3 Mixed and damaged streams

Collection covers batteries regardless of condition. SSCC identifies a mixed container, and records associate it with measured or estimated content by category and chemistry. After sorting, new logistic units and measured contents can be related to the incoming unit. Damaged, leaking or thermally affected batteries are segregated and recorded at the level needed for safety and transport controls. If an original label, serial number or QR code or passport identifier is unreadable, an operator must not create an unverified link. A local consignment identifier can preserve custody while recording that the original identity is unknown.

10.7.4 Shipments of used and waste batteries

The Regulation requires this evidence but does not prescribe GS1 standards. This guideline proposes the following for the records behind it:

Need	GS1 application	Limitations
State the identification number of the battery on the record, where applicable (Annex XIV, point 3)	GTIN plus serial number identifies an individual battery, and GTIN plus batch/lot number identifies a batch	A GS1 identifier does not show that a battery is used and not waste. It does not replace the record, and an unreadable identifier must not be reconstructed
Identify the holder and the testing company	GLN identifies the legal entity or location, with its name and address in the associated data	The record still has to state the name and address
Identify the load and its contents	SSCC identifies the logistic unit, and records hold its contents	SSCC does not identify the batteries inside
Record the movement	EPCIS shipping and receiving events record custody, with transaction references to the invoice and transport document	Event records do not authorise a shipment or prove equivalent treatment

Technical basis: GS1 General Specifications, sections 1.3.1.2, 1.3.1.4, 1.3.3 and 1.3.5.1; GS1 EPCIS Standard, version 2.0.1, sections 7.4.2–7.4.3, pp. 78–88.

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11 Re-use and other circular operations

11.1 The operations

The Regulation distinguishes the operations by waste status, intended purpose and technical outcome (Article 3(1), points (29)–(32)):

Operation	What it means
Re-use	A used battery used again. It does not itself amount to a new placing on the market
Preparation for re-use	A waste battery prepared for use again without other pre-processing
Preparation for repurposing	A waste battery prepared for a different purpose or application
Repurposing	A battery that is not waste, used for a different purpose or application
Remanufacturing	A used battery disassembled and evaluated at cell and module level, restored to at least 90% of original rated capacity, with no more than 3% difference in state of health between individual cells, for its original purpose or application

A battery intended for industrial use after preparation for repurposing or repurposing is an industrial battery (Article 3(1), point (13)). Classify the battery after the operation: its category and intended use may change the requirements and the passport outcome. The resulting battery requires a passport only if its capacity is greater than 2 kWh.

11.2 Placing on the market again

A used battery undergoing only re-use is considered to have been placed on the market when first made available. A battery subjected to preparation for re-use, preparation for repurposing, repurposing or remanufacturing is placed on the market anew (Article 38(11), read with recital 16). An imported used battery is placed on the Union market when it first enters the Union, and an imported battery that has undergone a listed operation must comply with the applicable requirements on entering the Union (recital 16). The original conformity assessment, category and passport outcome cannot simply be assumed to remain sufficient.

11.3 Responsibility

An operator that carries out a listed operation and places the resulting battery on the market or puts it into service is considered a manufacturer (Article 38(11)). It performs the applicable manufacturer duties, including technical documentation, conformity assessment with an additional Module A assessment, the EU declaration of conformity, CE marking, identification, instructions, safety information and labelling (Articles 17–20 and 38). Examination, performance testing, packing and shipment follow adequate quality-control and safety instructions. The operator complies with the Regulation and relevant Union product, environmental, health and transport-safety law, taking account of any category change (Article 45). A remanufacturing operator gives authorities, on request, documentation that meets Article 3(1), point (32).

The due-diligence rules in Chapter VII of the Regulation do not apply to batteries already placed on the market before the listed operation (Article 47), but this does not remove the duties under Articles 38 and 45. The carbon-footprint and recovered-material requirements do not apply either to such batteries (Articles 7(5) and 8(4)).

11.4 Labels, QR code and passport

Article 13(9) requires a battery subjected to a listed operation to bear new labels or markings with information on the change of status, accessible through the QR code. Annex XIII, point 4(c), lists “original”, “repurposed”, “re-used”, “remanufactured” and “waste”.

Above 2 kWh, the QR code gives access to a new passport. Responsibility for the accuracy, completeness and currency of the information moves to the operator placing the resulting battery on the market or putting it into service, and the new passport is linked to the passport or passports of the original battery or batteries (Article 77(7)). The link has to remain available even where a new GTIN and serial number are allocated, and it may represent one-to-one, one-to-many or many-to-one lineage. The Regulation does not prescribe GS1 as the linking method, and which rules apply to predecessor links remains open (OQ-REG-

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017). At or below 2 kWh there is no passport. The information required under Article 13(9) is unresolved (OQ-REG-007), and a link to the original battery is an operational measure.

When a passport battery becomes waste, responsibility moves to the producer, appointed PRO or selected waste management operator, and the passport ceases to exist after recycling (Article 77(7)–(8)).

11.5 End-of-waste evidence

Article 73 applies to waste LMT, industrial and EV batteries subjected to preparation for re-use or preparation for repurposing. To demonstrate on request that a battery is no longer waste, its holder provides:

- a record of state-of-health evaluation or testing carried out in a Member State, confirming performance relevant to the further use;
- an invoice or contract documenting sale or transfer of ownership for further use; and
- evidence of protection against damage in transport, loading and unloading, including sufficient packaging and appropriate stacking.

The state-of-health record accompanies the battery and is available to end-users and persons acting for them on equal terms, with commercially sensitive information protected (Article 73(1)–(3)). Whether an Article 73(4) act has set further requirements needs checking (OQ-REG-012).

11.6 How GS1 standards support lifecycle relationships

The Regulation requires renewed identification (Article 38(6)) and status information (Article 13(9)) and, for passport batteries, a link between new and original passports. It does not prescribe GS1 standards. This guideline proposes the following:

Need	GS1 application	Limitations
Identify the resulting battery	GS1 General Specifications, section 2.1.15, "Identification of non-new trade items", determines whether the existing GTIN is kept or a new GTIN is allocated. It refers to the GTIN Management Standard only where a new GTIN is allocated because the original GTIN cannot be recovered	A new passport or status is not automatically an instruction to assign a new GTIN
Identify an individual resulting battery	GTIN plus serial number identifies the resulting individual battery. The associated records link that battery to the original battery or batteries	Universal serialisation is not imposed. Do not reuse an original serial identifier for a different resulting battery. The identifier does not replace the new passport
Identify a production or test batch	GTIN plus batch/lot number identifies the production or test batch. Associated records link that batch to test results, components and process evidence	Choose the level by whether evidence varies by batch or by battery
Keep the link to the original	Records link the original and resulting batteries using their GTINs and relevant batch/lot or serial numbers. The records also identify who recorded the relationship, when, the operation performed and the supporting evidence	Access controls keep confidential data within the legal or business purpose
Identify the operator and facility	GLN identifies the legal entity, function or location	A GLN adds to, and does not replace, a permit or registration number, and does not prove competence or conformity
Identify a shipment	SSCC identifies the logistic unit, and records hold its contents	SSCC identifies the logistic unit. Its contents record needs to reflect changes when units are packed or split; SSCC alone does not identify the contained batteries
Record the events	EPCIS captures receipt, inspection, state-of-health testing, disassembly, transformation, assembly, commissioning, packing, shipping and disposition change. An EPCIS TransformationEvent links identified inputs to the outputs produced by a process. An AssociationEvent records a relationship between identified objects, such as a battery and its host product,	CBV does not reproduce the legal categories. EPCIS does not prove end-of-waste status, remanufacturing or conformity or passport compliance

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Need	GS1 application	Limitations
	or the end of that relationship. CBV defines terms such as inspecting, repairing, disassembling and commissioning	

Resulting batteries, removed cells, replacement components, packaging and logistic units are distinct objects, each identified at the level its process needs. Technical basis: GS1 General Specifications, section 2.1.15, pp. 133–134, and section 1.3.1.4, pp. 39–40; GS1 EPCIS Standard, version 2.0.1, sections 7.4.5–7.4.6, pp. 93–102.

12 Supply-chain records and information exchange

12.1 What the Regulation requires

Economic operators must, on request of a national authority, provide market surveillance authorities with the identity of any economic operator that supplied them with a battery and of any operator they supplied, with the quantity and exact models. They must be able to do so for ten years after being supplied and ten years after supplying (Article 46). This applies independently of the battery passport, and neither a passport nor a due-diligence system replaces these records. Recital 76 explains the purpose: tracing operators makes market surveillance simpler and more efficient.

A minimal record preserves the supplying and receiving operators, the exact battery model and the quantity. Transaction date, document reference, ship-from and ship-to location, batch/lot or serial identifier, logistic-unit identifier and event time aid retrieval, reconciliation and recall, but Article 46 does not expressly require them. It requires operator and model traceability, not consumer identity or universal serialisation.

12.2 Critical Tracking Events and Key Data Elements

The Regulation does not prescribe GS1 standards or a particular traceability system. This guideline proposes using EPCIS to build the traceability system, based on Critical Tracking Events (CTEs) and Key Data Elements (KDEs). They define when information needs to be captured and which information is needed.

A CTE is an event in the life of a battery or batch where information needs to be recorded for the traceability purpose, such as receiving, manufacturing, packing, shipping, installation, collection or treatment. The KDEs answer who, what, where, when and why:

- **Who and where:** GLN identifies the parties, functions and locations involved.
- **What:** GTIN identifies the battery trade item, GTIN plus batch/lot number identifies a production batch, and GTIN plus serial number identifies an individual battery. SSCC identifies a logistic unit. Quantities state how many objects, or how much of the identified material, are involved. In EPCIS, class-level quantities form part of the ‘What’ dimension (GS1 EPCIS Standard, version 2.0.1, sections 7.2.2 and 7.3.3.1).
- **When and why:** The date and time record when the event occurred, and the business context explains the activity and reason.

These concepts are part of the GS1 Global Traceability Standard.

For Article 46, a GLN works as a party key linked to the name, address and evidence of the operator’s identity (GS1 Global Location Number Data Model Solution Standard, sections 4–5, pp. 11–50). It does not replace an authority-issued identifier.

Section 12.3 shows which types of data carry this information and how GS1 standards share them.

12.3 Master data, transaction data and event data

Traceability relies on different types of data. Master data describes identified trade items, parties and locations. Transaction data records commercial activities such as orders, deliveries and invoices. Event data records observations and business events involving identified objects. These data sets complement

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one another: an event record does not replace the product attributes or commercial documents needed to interpret it.

Type of data	What it is	How GS1 standards share it
Master data	Descriptive attributes of objects, parties and locations identified with GS1 identifiers, which are relatively stable	GDSN exchanges trade-item master data. Location and party data can be registered and shared through GS1 registry platforms
Transaction data	Trade transactions that trigger or confirm activities, such as orders, deliveries and invoices	Electronic Data Interchange (EDI), or documents supplied with a shipment
Event data	Where an object is, when it happened and why, through the supply chain	EPCIS shares event data

Transaction data is exchanged through existing commercial processes and documents, so this guideline gives no separate guidance on it. The two subsections below cover master data and event data.

12.3.1 Master data with GDSN

GDSN operates through interoperable, GS1-certified data pools. A company connects to a certified data pool to publish its trade-item master data or subscribe to data published by trading partners. The data pools synchronise updates between participating sources and recipients. Technical basis: GS1 System Architecture, version 12.0.0, sections 6.4 and 7.4, “Services offered for the GDSN” (official source).

Where GDSN is used to share battery master data, identify whether each attribute describes the battery or a host product, the responsible data owner, target market, units, conditions and validation rules. The sources reviewed for this guideline do not establish that current GDSN attributes and target-market profiles cover every data element required by the Regulation.

12.3.2 Event data with EPCIS

CTEs define which activities need to be recorded for traceability. EPCIS defines how to represent and share those records, and CBV provides a common vocabulary for describing their business meaning. EPCIS is a choice of this guideline, not a requirement of the Regulation. An EPCIS implementation for battery traceability follows these steps:

1. **Define the purpose.** State which legal duty or business question the records need to answer, for which actor and for which period.
2. **Choose the level of detail.** Select model, batch, individual battery, packaging or logistic-unit granularity. Do not use a GTIN alone to identify an individual battery.
3. **Identify parties and locations.** GLN identifies the relevant parties, functions and locations.
4. **Define the events and data.** Choose the CTEs and KDEs (section 12.2), including quantities, corrections, returns, splits, aggregation and transformation.
5. **Map events to EPCIS and CBV.** Match processes to EPCIS event types and CBV terms after checking their full definitions. A CBV term that resembles a regulated activity does not mean the Regulation requires it or that the event proves lawful performance.
6. **Set up data management.** Define capture, validation, storage, query, authentication, authorisation and retention.
7. **Test the records.** Check that records answer the relevant request, including Article 46 throughout its ten-year periods.

The table shows how common battery processes map to EPCIS event types.

Process	EPCIS event	Relationship preserved
Observing receipt or shipment	ObjectEvent with the appropriate business context	Identified objects or quantities, event time, locations and transaction references
Packing batteries or cases into a logistic unit	AggregationEvent, where its physical containment semantics apply	Parent logistic-unit identity and contained identities or quantities

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Process	EPCIS event	Relationship preserved
Installing or removing a battery in a host product	AssociationEvent, where its semantics apply	The identified battery's relationship to the host
Consuming material inputs and producing battery outputs	TransformationEvent	Identified inputs, outputs and quantities, to the precision the process evidence supports

Shipping and receiving are separate observations; one does not prove the other. Define how discrepancies, partial receipts, returns and reading errors are corrected. SSCC identifies the logistic unit. A separate contents record links that unit to the battery identifiers or recorded quantities it contains. Without that relationship, an SSCC lookup does not reveal which batteries were shipped. Assembly in which components remain recognisable is not automatically a transformation, so select event types and CBV values from their full definitions. Storage and transport under an importer's, distributor's or fulfilment provider's responsibility must not jeopardise conformity (Articles 41(4), 42(4) and 43). EPCIS carries condition information where needed, but the Regulation does not impose continuous monitoring or require EPCIS.

EPCIS supports capture and query interfaces, access control and redaction, and it does not require one database (GS1 EPCIS Standard, version 2.0.1, sections 8.1–8.2, pp. 103–145). An EPCIS repository is not the battery passport, although event-derived information can feed a passport where Article 77 and Annex XIII require it. EPCIS supports visibility and evidence management; it does not replace conformity assessment, audit, verification, certification or an authority decision.

12.4 Data quality, access and confidentiality

Traceability data has to be accurate, complete, timely and consistent enough for its function. Controls cover identifier validity, model and quantity reconciliation, duplicate events, late data, corrections, master-data changes and preservation (GS1 Global Traceability Standard, sections 3.3.1–3.3.5, pp. 18–21). Access is based on role and purpose. An Article 46 record has to be available to a market surveillance authority on request, but Article 46 does not require it to be public or prescribe a network architecture. Data-protection, confidentiality, cybersecurity and contractual requirements continue to apply. For passport batteries, Articles 77(5)–(6) and 78 separately require open standards and role-based access and update rights.

12.5 Recall and withdrawal

Traceability records help determine affected models, batches or instances, identify recipients and quantities, locate stock, notify trading partners, reconcile returns and keep an auditable response record. Article 46 does not universally require batch or serial data. If records exist only at model level, the affected scope may have to include all units of that model supplied during the relevant period. Finer identification narrows an action only where reliable evidence confines both the issue and the distribution to that batch or those instances. Chapter 3 sets out the duties.

13 Category implementation example

These examples show how the decisions in the preceding chapters apply. They are illustrative, not complete compliance checklists. Each states assumed facts; a change in intended use, capacity, configuration, actor or date can change the result. The Regulation does not prescribe GTIN, GLN, SSCC, GS1 Digital Link or EPCIS for these examples. In the conceptual identifiers, `example.com` and the values in braces are placeholders.

13.1 Industrial battery of exactly 2 kWh

Assumed facts. A manufacturer places a 2 kWh rechargeable battery on the market solely for industrial use. It is not an LMT, EV or SLI battery or a stationary battery energy storage system. Capacity is evidenced on the applicable technical basis.

Regulatory outcome. Article 77(1) applies to an industrial battery only above 2 kWh, so a battery at exactly 2 kWh does not require a passport. Article 13(6)(b) applies from 18 February 2027. Waste take-back applies irrespective of the threshold (Article 61(1)–(4)), and due-diligence scope depends on Article 47.

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GS1 implementation. GTIN identifies the trade item. GTIN plus batch/lot number links production groups to test evidence, and GTIN plus serial number supports warranty or servicing. A GS1 Digital Link URI connects the chosen identifier to the Article 13(6)(b) information. GLN identifies parties or sites, and SSCC identifies a shipment unit.

Limits. GS1 granularity does not determine legal capacity or category, and a serialised information page is not a passport. GDSN use requires verified coverage.

13.2 Industrial battery of 5 kWh

Assumed facts. A manufacturer places a separately traded, serialised 5 kWh rechargeable industrial battery on the market after 18 February 2027.

Regulatory outcome. The battery requires a passport because its capacity is greater than 2 kWh (Article 77(1)), and Article 13(6)(a) gives the QR route. Performance and durability documentation applies under Article 10(1) and Annex IV, Part A. Carbon-footprint and recovered-material duties apply within their stated conditions (Articles 7–8).

GS1 implementation. GTIN identifies the trade item, and GTIN plus serial number identifies each battery with a passport. A GS1 Digital Link URI, for example `https://example.com/01/{GTIN}/21/{SERIAL}`, connects that identifier to the passport. Model data is associated with the GTIN and individual data with the serialised identifier. EPCIS captures shipment, installation, maintenance and circular events, and GLN identifies parties and locations.

Limits. GTIN alone is not sufficient for an individual passport. Identifiers are not reassigned when a website or service provider changes. The responsible operator keeps the Article 77(4) duties.

13.3 Stationary battery energy storage system of 100 kWh

Assumed facts. A manufacturer places a 100 kWh rechargeable stationary battery energy storage system on the market for an industrial installation. It meets Article 3(1), point (15).

Regulatory outcome. The system is an industrial battery and, because it exceeds 2 kWh, requires a passport from 18 February 2027 (Article 77(1)). Article 12 requires technical documentation and evidence of successful safety testing against Annex V. Article 14 and Annex VII govern state-of-health and expected-lifetime data in the battery management system.

GS1 implementation. The operator first defines the battery that carries the passport and distinguishes it from modules, racks, installation and host equipment. GTIN plus serial number identifies that battery. Separate GTINs identify independently traded modules, and recorded relationships support replacement. GLNs identify parties or locations, and EPCIS records commissioning and module replacement.

Limits. Internal module tracking does not itself create a passport duty for every module. The legal and technical battery boundary has to be established. OQ-REG-005 remains relevant to systems at or below 2 kWh and to capacity evidence.

14 Dates and remaining verification

14.1 Key dates

Date or trigger	Requirement	Provision
18 August 2024	Performance and durability document for rechargeable industrial batteries above 2 kWh; stationary-system documentation and battery management system duties; economic-operator and conformity framework (Chapter VI of the Regulation)	Articles 10(1), 12(2), 14 and 96(2)(b)
18 August 2025	Separate-collection symbol and producer-responsibility rules (Chapter VIII of the Regulation)	Articles 13(4) and 96(2)(c)
Conditional from 18 February 2026*	Carbon-footprint declaration for rechargeable industrial batteries above 2 kWh, except exclusively external storage	Article 7(1)
13 August 2026	Replacement Annex I table	Annex I; Regulation (EU)

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Date or trigger	Requirement	Provision
		2026/1738
Conditional from 18 August 2026*	General label	Article 13(1), (10)
18 February 2027	QR code for industrial batteries; passport for each industrial battery above 2 kWh, including upload of the unique identifier	Articles 13(6), 77(1) and 77(10)
30 June 2027	First Article 75 reports, covering reporting year 2026	Article 75(7); Implementing Regulation (EU) 2025/2289, Article 2
18 August 2027	Battery due diligence, for covered operators	Article 48(1), as amended
Conditional from 18 August 2027*	Carbon-footprint class and label, and minimum performance and durability values, except exclusively external storage	Articles 7(2) and 10(2)
Conditional from 18 August 2028*	Recovered-material documentation for qualifying industrial batteries above 2 kWh	Article 8(1)
Conditional from 18 February 2029*	Maximum carbon-footprint threshold, except exclusively external storage	Article 7(3)
Conditional from 18 August 2030*	Carbon-footprint declaration for exclusively external storage	Article 7(1)
18 August 2031	First minimum recovered-material shares, subject to amendment	Article 8(2)
Conditional from 18 February 2032*	Carbon-footprint class and label for exclusively external storage	Article 7(2)
Conditional from 18 August 2033*	Maximum carbon-footprint threshold for exclusively external storage	Article 7(3)
18 August 2036	Later minimum recovered-material shares, subject to amendment	Article 8(3)

* A conditional requirement applies from the date shown or after the period specified in the Regulation following the entry into force of the relevant delegated or implementing act, whichever is later. Before treating such a date as operative, verify the act, its entry into force and the period specified in the cited provision. The Cd and Pb marking transition requires legal confirmation (OQ-REG-002).

14.2 Open questions

Check these before relying on a statement that cites them. “Legal interpretation” means the Regulation does not settle the point. “Act or source to verify” means the answer depends on a secondary act or other source that has not been fully reviewed for this guideline.

Code	Question	Provisions	Status	Chapters
OQ-REG-001	Has the Article 13(10) implementing act entered into force, and which date and specifications now govern the labels?	Article 13(1)–(3), (10)	Act or source to verify	4
OQ-REG-002	How do the Cd and Pb marking duty and the transition from Directive 2006/66/EC interact between 18 February 2024 and 18 August 2025?	Articles 13(5), 95 and 96	Legal interpretation	4
OQ-REG-003	What must the QR code do where no Article 52(3) report is required because the operator or battery is outside Chapter VII of the Regulation?	Articles 13(6)(b), 47 and 52(3)	Legal interpretation	4, 8
OQ-REG-005	How should capacity be evidenced at the 2 kWh passport boundary, and are stationary systems of 2 kWh or less placed on the market in practice?	Article 3(1), point (15); Articles 12, 14 and 77(1)	Legal interpretation	2, 4
OQ-REG-007	Which Annex XIII, point 4 information must be QR-accessible for non-passport batteries	Article 13(9); Annex XIII, point 4; Article	Legal interpretation	4, 11

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Code	Question	Provisions	Status	Chapters
	after a circular operation, at what granularity and from when?	77(1)		
OQ-REG-008	Is the Article 38(4) reference to Annex IX a drafting error, and how does its 10-year period fit the different Annex VIII wording?	Article 38(4); Annex VIII	Act or source to verify	3
OQ-REG-012	Has an Article 73(4) act set end-of-waste technical and verification requirements?	Article 73(4)	Act or source to verify	11
OQ-REG-014	What content and retention apply to Article 65(2) and Article 46 records beyond what is expressly listed?	Articles 46 and 65(2)	Legal interpretation	10
OQ-REG-016	Three points remain on the replacement Annex I: whether Article 4(2)(a) of Directive 2000/53/EC still restricts batteries until 31 August 2032, now that its battery exemptions ended on 13 August 2026; whether Annex I, entry 3(1), reaches a portable battery in an M1 or N1 vehicle; and how “homogeneous material” applies to a battery.	Article 6(1); Annex I, entries 2–4; Regulation (EU) 2026/1738, Articles 5(5) and 57(1)(a)	Legal interpretation	2
OQ-REG-017	Which current passport access, field applicability, registry and predecessor-link rules apply?	Articles 77–78; Annex XIII; Implementing Regulation (EU) 2026/1778	Act or source to verify	4, 7, 11
OQ-REG-018	Which adopted measures govern carbon-footprint methods, classes and thresholds, Article 8 calculations and Article 10 minimum values?	Articles 7, 8 and 10; Annexes II and IV	Act or source to verify	2
OQ-REG-020	Which current shipment instruments and transitional rules govern used and waste batteries?	Article 72; Annex XIV	Act or source to verify	10
OQ-REG-022	Is there an Annex XIII, point 1(t) on instructions for use? Commission guidance version 3.2 cites one, but the consolidated text of 13 August 2026 ends at point 1(s).	Annex XIII, point 1	Act or source to verify	15

GS1 standards support implementation but do not establish compliance. National reporting formats are confirmed with each Member State (chapter 9).

15 Data model for industrial batteries

This chapter lists the information relevant to industrial batteries and explains each attribute’s meaning, data type, applicability and conditions. The chapter references show where the underlying requirement is explained. The tables bring together information used for labelling, information access, reporting and other regulatory functions; not every attribute is information provided through the QR code. The full list, for all battery types, is in Annex A, the “Attributes” sheet of the separately published companion workbook `EU_battery_attribute_list_v0.5_GS1.xlsx`. It does not map the attributes to GS1 standards. The Regulation requires passport information to be structured, machine-readable and interoperable (Article 77(5)), but it does not prescribe GS1 standards for this.

15.1 How this overview was created

The list was built in four steps:

1. **Commission data model.** The Commission’s battery data model, version 1.0.0 of 30 October 2026, is the starting point. It is official but is not a legal act. The names, definitions and data types of its attributes come from that model.

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2. **Regulation.** The list was checked against the consolidated text of the Regulation of 13 August 2026 and its secondary acts. Commission guidance on passport data points, version 3.2 of 19 October 2026, helped to interpret the data points. It states that it is not the Commission's official position.
3. **Additions.** Attributes the Regulation requires but the Commission's model does not yet contain were added. No Commission data model exists for industrial batteries of 2 kWh or less, because they have no passport, so the list reuses the Commission's terms where they fit.
4. **Check by battery type.** Every attribute was checked for this battery type against the Regulation. This chapter keeps the attributes that apply to industrial batteries and leaves out the rest.

15.2 How to read the tables

Column	Meaning
Attribute	The attribute's name. An asterisk (*) marks an attribute that is not in the Commission's model, so its name is a proposal in this guideline, not a Commission or GS1 term
Definition	The Commission's definition. For attributes marked with an asterisk, it is a definition written for this guideline from the legal text
Data type	The kind of value the attribute holds
Requirement	Whether the attribute applies to a battery above 2 kWh, which has a passport, and to a battery of 2 kWh or less, which follows the QR route (Article 13(6)(b)). A battery's capacity decides which column to use
Condition or timing	When a conditional or later attribute applies
Chapter	The chapter of this guideline that explains the requirement

Code	Meaning
M	Mandatory
O	Optional
C	Conditional: applies only in certain cases
Later	Required by the Regulation, but not to be filled in yet because of a later date or a secondary act
—	Not applicable

Read the tables with these limits in mind:

- **The Regulation prevails.** This overview is a reading aid. It does not create obligations or replace the legal text.
- **A code is a summary.** The notes in Annex A hold more detail on conditions, dates and open questions.
- **Not every attribute is QR-code information.** Some are held in the battery management system, kept for authorities or reported by the producer.
- **The list is a working document and may be updated.** Attributes marked with an asterisk have not yet been reviewed by the Commission or GS1.
- **Each attribute describes the battery** unless the table says otherwise. Keep battery data separate from host-product data (chapter 5).

Annex A also shows each attribute's identifier, access rights, allowed units, code list, application date, legal basis, guidance data point and notes. Identifiers starting with `GS1-` mark added attributes. The prefix marks the additions only: these attributes are not GS1 standard terms.

15.3 The data model

15.3.1 Passport record

These attributes describe the passport itself. They apply only to batteries above 2 kWh.

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Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
digitalProductPassportId	Identifier of an instance of the digital product passport.	Text	M	—		4
uniqueProductIdentifier	Unique character string that identifies a product.	Text	M	—		4
granularity	The level at which a unique product identifier applies, such as model level, batch level or item level.	Code (granularity-level)	M	—		6
dppStatus	The current lifecycle status of a digital product passport.	Code (instance-status)	M	—		4
lastUpdate	Date and time at which a digital product passport was most recently modified or updated.	Date-time	M	—		4
contentSpecificationIds	Identifiers of content specifications, schemas or data models that govern the structure of the digital product passport content.	List of Text	M	—		4
registrantIdentity	Identity of who is registering and/or is responsible for the battery passport [name]	Text	M	—		4
originalBatteryPassportLink *	Link from a new battery passport to the passport or passports of the original battery or batteries.	List of URI	C	—	Only after a listed circular operation. Not in the Commission 's model (OQ-REG-017)	11

15.3.2 Manufacturer and importer

Importer attributes apply only to imported batteries.

Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
manufacturerIdentification	Manufacturer name, registered trade name or registered trademark [at least one of]	Group	M	M		4, 3
manufacturerName	Manufacturer name, registered trade name or registered trademark [at least one of]	Text	C	C	At least one of name, registered trade name or trade mark (Article 38(7))	4, 3
manufacturerTradeName	Manufacturer name, registered trade name or registered trademark [at least one of]	Text	C	C	At least one of name, registered trade name or trade mark	4, 3

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Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
					(Article 38(7))	
manufacturerTrademark	Manufacturer name, registered trade name or registered trademark [at least one of]	Text	C	C	At least one of name, registered trade name or trade mark (Article 38(7))	4, 3
manufacturerPostalAddress	Manufacturer single contact postal address	Text	M	M		4, 3
manufacturerContactDetails	If available, manufacturer web and email address [both optional]	Group	O	O		4, 3
manufacturerWebsite	If available, manufacturer web and email address [both optional]	URI	O	O		4, 3
manufacturerEmail	If available, manufacturer web and email address [both optional]	URI	O	O		4, 3
importerIdentification *	Importer name, registered trade name or registered trade mark [at least one of].	Group	C	C	Imported batteries only	3
importerName *	Importer name.	Text	C	C	Imported batteries only	3
importerTradeName *	Importer registered trade name.	Text	C	C	Imported batteries only	3
importerTrademark *	Importer registered trade mark.	Text	C	C	Imported batteries only	3
importerPostalAddress *	Importer postal address, indicating a single contact point.	Text	C	C	Imported batteries only	3
importerWebsite *	Importer web address, if available.	URI	C	C	Imported batteries only, if available	3
importerEmail *	Importer email address, if available.	URI	C	C	Imported batteries only, if available	3

15.3.3 Battery identification and manufacture

At least one manufacturer name and one identification element are needed, which is why the sub-attributes are conditional.

Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
batteryCategory	Battery category [3-code list]	Code (battery-category)	M	M		1.4, 4
batteryIdentification	Model identification and batch or serial number, or product number or another element allowing	Group	M	M		6, 4

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Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
	their identification [at least one of]					
modelIdentifier	Model identification and batch or serial number, or product number or another element allowing their identification [at least one of]	Text	C	C	Model identification with a batch or serial number, product number or another identifying element (Article 38(6))	6, 4
batchNumber	Model identification and batch or serial number, or product number or another element allowing their identification [at least one of]	Text	C	C	Model identification with a batch or serial number, product number or another identifying element (Article 38(6))	6, 4
serialNumber	Model identification and batch or serial number, or product number or another element allowing their identification [at least one of]	Text	C	C	Model identification with a batch or serial number, product number or another identifying element (Article 38(6))	6, 4
productNumber	Model identification and batch or serial number, or product number or another element allowing their identification [at least one of]	Text	C	C	Model identification with a batch or serial number, product number or another identifying element (Article 38(6))	6, 4
otherIdentificationElement	Model identification and batch or serial number, or product number or another element allowing their identification [at least one of]	Text	C	C	Model identification with a batch or serial number, product number or another identifying element (Article 38(6))	6, 4
manufacturingPlace	The place of manufacture (geographical location of a battery manufacturing plant) [town, region, country/jurisdiction]	Group	M	M		4
manufacturingCity	The place of manufacture (geographical location of a battery manufacturing plant) [town, region, country/jurisdiction]	Text	C	C	Where needed to state the location of the plant (Annex VI, Part A)	4
manufacturingRegion	The place of manufacture (geographical location of a battery manufacturing plant) [town, region,	Text	C	C	Where needed to state the location of the plant (Annex VI, Part	4

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Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
	country/jurisdiction]				A)	
manufacturingCountry	The place of manufacture (geographical location of a battery manufacturing plant) [town, region, country/jurisdiction]	Country code (ISO 3166-1 alpha-3)	M	M		4
manufacturingDate	The date of manufacturing [month and year]	Year-month (YYYY-MM)	M	M		4

15.3.4 Physical characteristics and composition

These attributes describe the battery model.

Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
batteryWeight	The weight [unit kg]	Quantity (value + unit)	M	M		4
batteryCapacity	The capacity [unit Ah]	Quantity (value + unit)	M	M		4
batteryChemistry	The chemistry [code list]	List of codes (battery-chemistry)	M	M		4
hazardousSubstances	The hazardous substances present in the battery, other than mercury, cadmium or lead [free text]	List of Text	M	M		4
extinguishingAgent	Usable extinguishing agent [free text]	Multilingual text	M	M		4
criticalRawMaterials	Critical raw materials present in the battery in a concentration of more than 0,1 % weight by weight [code list]	List of codes (critical-raw-material)	M	M		4

15.3.5 Sustainability and responsible sourcing

"Later" means the Regulation requires the information, but it does not have to be filled in yet.

Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
carbonFootprintDeclaration *	Information on the carbon footprint of the battery referred to in Art. 7(1).	To be defined (implementing act on format pending)	Later	—	Rechargeable batteries above 2 kWh, from the Article 7 dates in chapter 2. Name is a proposal	2, 4
carbonFootprintPerformanceClass *	Carbon footprint performance class and label referred to in Art. 7(2).	To be defined (implementing act on format pending)	Later	—	Rechargeable batteries above 2 kWh, from the Article 7 dates in chapter 2. Name is a proposal	2, 4
dueDiligenceReport *	Report on the battery due	Document link (URL +	Later	Later	Only for operators within Articles 47–	8, 4

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Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
	diligence policy referred to in Art. 52(3).	media type)			48, from 18 August 2027. Name is a proposal. If no report exists: OQ-REG-003	
recoveredCobaltShare *	Share of cobalt recovered from waste present in active materials, calculated under Art. 8.	Quantity (value + unit)	Later	—	From the Article 8 date in chapter 2, where the metal is present. Excludes exclusively external storage. Per model, year and plant. Name is a proposal	2, 4
recoveredLithiumShare *	Share of lithium recovered from waste present in active materials, calculated under Art. 8.	Quantity (value + unit)	Later	—	From the Article 8 date in chapter 2, where the metal is present. Excludes exclusively external storage. Per model, year and plant. Name is a proposal	2, 4
recoveredNickelShare *	Share of nickel recovered from waste present in active materials, calculated under Art. 8.	Quantity (value + unit)	Later	—	From the Article 8 date in chapter 2, where the metal is present. Excludes exclusively external storage. Per model, year and plant. Name is a proposal	2, 4
recoveredLeadShare *	Share of lead recovered from waste present in the battery, calculated under Art. 8.	Quantity (value + unit)	Later	—	From the Article 8 date in chapter 2, where the metal is present. Excludes exclusively external storage. Per model, year and plant. Name is a proposal	2, 4
renewableContentShare	The share of renewable content [%]	Quantity (value + unit)	M	—		4

15.3.6 Model performance data

These attributes are public passport data about the battery model.

Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
minimalVoltage	Minimal voltage, with temperature range when relevant [unit V, optional unit °C]	Quantity (value + unit) with temperature range	M	—		4
nominalVoltage	Nominal voltage, with temperature range when relevant [unit V, optional unit °C]	Quantity (value + unit) with temperature range	M	—		4
maximumVoltage	Maximum voltage, with temperature range when relevant [unit V, optional unit	Quantity (value + unit) with temperature	M	—		4

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Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
	°C]	range				
originalPowerCapability	Original power capability [unit W]	Quantity (value + unit)	M	—		4
powerLimit	Power limits, with temperature range when relevant [unit W, optionally min_T °C ... max_T °C]	List of Quantity (value + unit) with temperature range	M	—		4
expectedLifetimeCycles	Expected battery lifetime expressed in cycles [in number]	Integer	C	—	Rechargeable batteries above 2 kWh only	4
cycleLifeReferenceTest	Reference test used for expected battery lifetime expressed in cycles [free text]	Multilingual text	C	—	Rechargeable batteries above 2 kWh only	4
notInUseTemperatureRange	Temperature range the battery can withstand when not in use (reference test) [min_T °C ... max_T °C + free text]	Group	M	—		4
notInUseTemperatureRangeTest	Temperature range the battery can withstand when not in use (reference test) [min_T °C ... max_T °C + free text]	Multilingual text	M	—		4
valueRange	Range of values (contains lowerbound and upperbound)	Temperature range (min, max)	M	—		4
commercialWarrantyPeriod	Period for which the commercial warranty for the calendar life applies [months]	Integer	C	—	Where a commercial warranty for calendar life is given. A whole number; the definition says months	4
initialRoundTripEnergyEfficiency	Initial round trip energy efficiency [%]	Quantity (value + unit)	C	—	Rechargeable batteries above 2 kWh only	4
roundTripEfficiencyAtHalfCycleLife	Round trip energy efficiency at 50 % of cycle-life [%]	Quantity (value + unit)	C	—	Rechargeable batteries above 2 kWh only	4
internalCellResistance	Internal battery cell resistance [unit Ω]	Quantity (value + unit)	M	—		4
internalPackResistance	Internal battery pack resistance [unit Ω]	Quantity (value + unit)	M	—		4
cycleLifeChargeCRate	Charge C-rate of	Quantity	C	—	Rechargeabl	4

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Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
	relevant cycle-life test [number]	(value + unit)			e batteries above 2 kWh only	
cycleLifeDischargeCRate	Discharge C-rate of relevant cycle-life test [number]	Quantity (value + unit)	O	—		4

15.3.7 Labels, markings and conformity

CE marking and the symbols are physical markings. A data attribute records them and does not replace them.

Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
separateCollectionSymbol	The marking requirements laid down in Article 13(4) [Yes/No]	Boolean (always true)	M	M		4
chemicalSymbol	The marking requirements laid down in Article 13(5) [code list]	List of codes (battery-chemical-symbol)	C	C	Above 0.002% cadmium or 0.004% lead (Article 13(5)). Marking date: OQ-REG-002	4
euDeclarationOfConformity	The EU declaration of conformity referred to in Article 18 [a web link]	Document link (URL + media type)	M	M		3, 4
ceMarking *	Whether the battery bears the CE marking.	Boolean	M	M		3, 4
notifiedBodyIdentificationNumber *	Identification number of the notified body following the CE marking.	Text	C	C	Only where Annex VIII requires it	3
batteryInstructionsAndSafetyInformation *	Clear, understandable and readable instructions and safety information accompanying the battery.	Multilingual text or document link	M	M		3
technicalDocumentation *	Technical documentation for the conformity assessment.	Document link	M	M		3, 2
complianceTestReportResults	Results of test reports proving compliance with the requirements laid down in this Regulation or any delegated or implementing act adopted pursuant to this Regulation [a	Document link (URL + media type)	M	—		4

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Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
	web link]					

15.3.8 Waste prevention, producer and reporting information

Some of these attributes describe the producer, the sale or a report, not the battery.

Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
wasteBatteryPreventionManagementInfo	The information regarding the prevention and management of waste batteries laid down in Article 74(1), points (a) to (f) [multiple free text]	Group	M	M		10, 4
endUserRoleInWastePrevention	The information regarding the prevention and management of waste batteries laid down in Article 74(1), points (a) to (f) [multiple free text]	Multilingual text	M	M		10, 4
endUserRoleInSeparateCollection	The information regarding the prevention and management of waste batteries laid down in Article 74(1), points (a) to (f) [multiple free text]	Multilingual text	M	M		10, 4
separateCollectionPoints	The information regarding the prevention and management of waste batteries laid down in Article 74(1), points (a) to (f) [multiple free text]	Multilingual text	M	M		10, 4
takeBackCollectionPoints	The information regarding the prevention and management of waste batteries laid down in Article 74(1), points (a) to (f) [multiple free text]	Multilingual text	M	M		10, 4
preparationForReuseFacilities	The information regarding the prevention and management of waste batteries laid down in Article 74(1), points (a) to (f) [multiple free text]	Multilingual text	M	M		10, 4
preparationForRepurposingFacilities	The information regarding the prevention and management of waste batteries laid down in Article 74(1), points (a) to (f) [multiple free text]	Multilingual text	M	M		10, 4
wasteBatteryTreatmentFacilities	The information regarding the prevention and management of waste batteries laid down in Article 74(1), points (a) to (f) [multiple free text]	Multilingual text	M	M		10, 4
wasteBatterySafetyInstructions	The information regarding the prevention and management of waste batteries laid down in	Multilingual text	M	M		10, 4

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Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
	Article 74(1), points (a) to (f) [multiple free text]					
batteryLabelSymbolMeaning	The information regarding the prevention and management of waste batteries laid down in Article 74(1), points (a) to (f) [multiple free text]	Multilingual text	M	M		10, 4
batterySubstancesImpact	The information regarding the prevention and management of waste batteries laid down in Article 74(1), points (a) to (f) [multiple free text]	Multilingual text	M	M		10, 4
storageCollectionSafetyInformation *	Safety and protective measures, including occupational safety, for storing and collecting waste batteries.	Multilingual text or document link	M	M		10
treatmentModelInformation *	Dismantling processes and safety measures for storage, transport and treatment, identifying components, materials and the location of hazardous substances.	Document link	C	C	Electronically and free of charge, on request, as far as operators need it (Article 74(3))	10
producerRegistrationNumber *	Registration number granted by the competent authority of each Member State.	List of Text	M	M		9
wasteManagementCostsAtSale *	Costs covered by the producer under Art. 56(4) (a)-(d), shown separately to the end-user.	To be defined	M	M		9
firstMadeAvailableQuantity *	Amount first made available on the market in a Member State in a calendar year, by chemistry and category.	Quantity (value + unit)	M	M		9

15.3.9 Instructions, composition and dismantling

Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
instructionsForUse *	Instructions for use of the battery.	To be defined	Later	—	Commission guidance: not to be filled in as of February 2027. Legal basis open (OQ-REG-022). Name is a proposal	14
detailedComposition	Detailed composition, including materials used in the cathode, anode and electrolyte [free	Multilingual text	M	—		4

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Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
	text]					
sparePartReplacementDetails	Part numbers for components and contact details of sources for replacement spares [a web link]	Document link (URL + media type)	M	—		4
dismantlingInformation	Dismantling information, including at least: - exploded diagrams of the battery system/pack showing the location of battery cells, - disassembly sequences, - type and number of fastening techniques to be unlocked, - tools required for disassembly, - warnings if risk of damaging parts exist, - amount of cells used and layout [a web link]	Document link (URL + media type)	M	—		4
safetyMeasures	Safety measures [a web link]	Document link (URL + media type)	M	—		4

15.3.10 Performance and durability values

Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
ratedCapacity	Rated capacity (Ah)	Quantity (value + unit)	C	—	Rechargeable batteries above 2 kWh only. Same value as batteryCapacity	2, 4
capacityFade	Capacity fade [%]	Quantity (value + unit)	C	—	Rechargeable batteries above 2 kWh only	2, 4
powerCapability	Power [unit W]	Quantity (value + unit)	C	—	Rechargeable batteries above 2 kWh only	2, 4
powerFade	Power fade [%]	Quantity (value + unit)	C	—	Rechargeable batteries above 2 kWh only	2, 4
internalResistance	Internal resistance [unit Ω]	Quantity (value + unit)	C	—	Rechargeable batteries above 2 kWh only	2, 4
internalResistanceIncrease	Internal resistance increase [%]	Quantity (value + unit)	C	—	Rechargeable batteries above 2 kWh only	2, 4
roundTripEnergyEfficiency	Where applicable, energy round trip efficiency [%]	Quantity (value + unit)	C	—	Where applicable to the battery (Annex IV); rechargeable batteries above 2 kWh only	2, 4
roundTripEnergyEfficiencyFade	Where applicable, energy round trip efficiency fade	Quantity (value + unit)	C	—	Where applicable to the battery (Annex IV); rechargeable	2, 4

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Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
	[%]				batteries above 2 kWh only	
expectedLifetimeCyclesRest	The expected lifetime of the battery under the reference conditions for which it has been designed, in terms of cycles, except for non-cycle applications [number]	Integer	C	—	Rechargeable batteries above 2 kWh only	2, 4
expectedLifetimeYears	The expected lifetime of the battery under the reference conditions for which it has been designed [years]	Integer	C	—	Rechargeable batteries above 2 kWh only	2, 4

15.3.11 State of health and expected lifetime

This data is held in the battery management system (Article 14).

Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
remainingCapacity	Information on the state of health of the battery pursuant to Article 14: remaining capacity [unit Ah]	Quantity (value + unit)	C	C	Stationary battery energy storage systems only (Article 14). At 2 kWh or less, this is battery management system data, not QR information (OQ-REG-005)	2, 4
remainingPowerCapability	Information on the state of health of the battery pursuant to Article 14: where possible, the remaining power capability [unit W]	Quantity (value + unit)	C	C	Stationary battery energy storage systems only (Article 14). At 2 kWh or less, this is battery management system data, not QR information (OQ-REG-005)	2, 4
remainingRoundTripEfficiency	Information on the state of health of the battery pursuant to Article 14: where possible, the remaining round-trip efficiency [%]	Quantity (value + unit)	C	C	Stationary battery energy storage systems only (Article 14). At 2 kWh or less, this is battery management system data, not QR information (OQ-REG-005)	2, 4
selfDischargingRateSet	Information on the state of health of the battery pursuant to Article 14: where possible, the evolution of self-discharging rates [timestamp,	Group	C	C	Stationary battery energy storage systems only (Article 14). At 2 kWh or less, this is battery management system data, not QR information (OQ-	2, 4

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Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
	decrease % per year]				REG-005)	
selfDischargingRate	Information on the state of health of the battery pursuant to Article 14: where possible, the evolution of self-discharging rates [timestamp, decrease % per year]	List of Quantity (value + unit)	C	C	Stationary battery energy storage systems only (Article 14). At 2 kWh or less, this is battery management system data, not QR information (OQ-REG-005)	2, 4
recordedTime	Time when the value was recorded (timestamp).	Date-time	C	C	Stationary battery energy storage systems only (Article 14). At 2 kWh or less, this is battery management system data, not QR information (OQ-REG-005)	2, 4
ohmicResistance	Information on the state of health of the battery pursuant to Article 14: where possible, the ohmic resistance [unit Ω]	Quantity (value + unit)	C	C	Stationary battery energy storage systems only (Article 14). At 2 kWh or less, this is battery management system data, not QR information (OQ-REG-005)	2, 4
dateOfPuttingIntoService *	Date the battery was put into service, where appropriate.	Date	C	C	Stationary battery energy storage systems only. Article 14 data in the battery management system; not listed in Annex XIII	2
energyThroughput *	Energy throughput of the battery.	To be defined	C	C	Stationary battery energy storage systems only. Article 14 data in the battery management system; not listed in Annex XIII	2
capacityThroughput *	Capacity throughput of the battery.	To be defined	C	C	Stationary battery energy storage systems only. Article 14 data in the battery management system; not listed in Annex XIII	2
harmfulEvents *	Tracking of harmful events, such as the number of deep discharge events, time spent in extreme temperatures and time spent charging in extreme temperatures.	To be defined	C	C	Stationary battery energy storage systems only. Article 14 data in the battery management system; not listed in Annex XIII	2

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Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
`fullEquivalentCycles` *	Number of full equivalent charge-discharge cycles.	Integer	C	C	Stationary battery energy storage systems only. Article 14 data in the battery management system; not listed in Annex XIII	2

15.3.12 Battery status and use

Attribute	Definition	Data type	Above 2 kWh	2 kWh or less	Condition or timing	Chapter
`batteryStatus`	Information on the status of the battery, defined as 'original', 'repurposed', 're-used', 'remanufactured' or 'waste' [code list]	Code (battery-status)	M	C	At 2 kWh or less: new label through the QR code after a circular operation (Article 13(9); OQ-REG-007)	4, 11
`numberOfChargingCycles`	The number of charging cycles [number]	List of Integer	C	—	Once the battery starts to be used	4
`numberOfDischargingCycles`	The number of discharging cycles [number]	List of Integer	C	—	Once the battery starts to be used	4
`negativeEvents`	Negative events, such as accidents [multiple free texts]	Multilingual text	C	—	Once the battery starts to be used	4
`environmentalConditionHistogramSet`	Periodically recorded information on the operating environmental conditions, including temperature [code list, histogram, related units]	Group	C	—	Once the battery starts to be used	4
`environmentalConditionHistogram`	Periodically recorded information on the operating environmental conditions, including temperature [code list, histogram, related units]	Histogram list	C	—	Once the battery starts to be used	4
`stateOfChargeHistogram`	Periodically recorded information on the state of charge [histogram, %]	Histogram list	C	—	Once the battery starts to be used	4

15.4 Limitations

The Commission's model has no attributes yet for carbon footprint, responsible sourcing and recovered-material content. Commission guidance version 3.2 says this information does not have to be filled in as of February 2027. The attribute names used here for them are proposals, and the Commission's names may differ. The questions that affect this data model are OQ-REG-001, OQ-REG-003, OQ-REG-005, OQ-REG-007, OQ-REG-017 and OQ-REG-022 (chapter 14).

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16 Terms and abbreviations

This chapter explains the terms used in this guideline. Where a term comes from the Regulation, the legal text prevails.

16.1 Battery categories

Industrial batteries are one of these categories. Chapter 1.4 explains how to use the test for this guideline.

Term	Meaning	Source
Portable battery	A sealed battery weighing 5 kg or less, not designed specifically for industrial use, that is not an electric vehicle, LMT or SLI battery.	Article 3(1), point (9). "Portable" is a defined category and is not determined by weight alone.
Portable battery of general use	A rechargeable or non-rechargeable portable battery specifically designed to be interoperable and having one of these formats: 4.5 V (3R12), button cell, D, C, AA, AAA, AAAA, A23 or 9 V (PP3).	Article 3(1), point (10). This is a subcategory of portable battery.
Light means of transport battery (LMT battery)	A sealed battery weighing 25 kg or less, specifically designed to provide traction power for wheeled vehicles powered by an electric motor alone or by motor and human power, including type-approved category-L vehicles, and which is not an electric vehicle battery.	Article 3(1), point (11). No capacity threshold limits the Article 77(1) passport duty for an LMT battery.
Starting, lighting and ignition battery (SLI battery)	A battery specifically designed to supply electric power for starting, lighting or ignition and which can also be used for auxiliary or backup purposes in vehicles, other means of transport or machinery.	Article 3(1), point (12).
Industrial battery	A battery specifically designed for industrial uses; a battery intended for industrial uses after preparation for repurposing or repurposing; or any other battery weighing more than 5 kg that is not an electric vehicle, LMT or SLI battery.	Article 3(1), point (13). The Article 77(1) passport threshold is capacity greater than 2 kWh, not battery weight.
Stationary battery energy storage system	An industrial battery with internal storage, specifically designed to store electric energy from and deliver it to the grid, or to store electric energy for and deliver it to end-users, regardless of where and by whom it is used.	Article 3(1), point (15). It remains an industrial battery; its passport status depends on whether its capacity is greater than 2 kWh (Article 77(1)).
Electric vehicle battery	A battery that weighs more than 25 kg and is specifically designed to provide traction power in a hybrid or electric category-L vehicle, or a battery specifically designed to provide traction power in a hybrid or electric vehicle of category M, N or O.	Article 3(1), point (14). Applying the 25 kg limit to the battery is this guideline's reading, read with the LMT definition. The referenced vehicle categories are those in Regulations (EU) No 168/2013 and (EU) 2018/858.

16.2 Regulatory terms

Term	Meaning	Source
Battery passport	The electronic record required from 18 February 2027 for each LMT battery, each industrial battery with a capacity greater than 2 kWh and each electric vehicle battery placed on the market or put into service. It contains battery-model information and information specific to the individual battery. It is accessible through the Article 13(6) QR code, which links to the unique identifier attributed by the economic operator placing the battery on the market. The QR code and unique identifier must comply with the ISO/IEC 15459 standards listed in Article 77(3), or equivalent. The Regulation does not prescribe a GS1 identifier. Article 77(1) applies by reference to placement on the market or putting into service from 18 February 2027; it does not state that a battery placed on the market or put into service before that date acquires a passport merely by remaining in service. Following preparation for re-use, preparation for repurposing, repurposing or remanufacturing, a battery placed on the market or put into service is to have a new passport linked to the	Articles 13(6), 77(1)–(7) and 78; Annex XIII. The treatment of batteries placed on the market or put into service before 18 February 2027 follows the temporal wording of Article 77(1); later placement or putting into service after a circular operation must be assessed under Articles 38(11), 45 and 77(7).

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Term	Meaning	Source
	passport or passports of the original battery or batteries, and responsibility transfers to the operator specified in Article 77(7).	
Battery-passport unique identifier	The unique string of characters that identifies a battery and also enables a web link to its battery passport. For a passport battery, the economic operator placing the battery on the market attributes the identifier, and the QR code links to it.	Article 3(1), point (66); Article 77(3). The term concerns batteries within Article 77(1) and must not be applied automatically to the QR-code arrangements for other batteries. A GS1 identification structure supports this function only where the complete implementation meets the Regulation's requirements.
QR code	A machine-readable matrix code that links to information required by the Regulation. For a passport battery, the QR code provides access to the battery passport; for batteries outside Article 77(1), Article 13(6)(b) specifies a different information set.	Article 3(1), point (24); Article 13(6). A QR code is not, by itself, a battery passport.
Making available on the market	Any supply of a battery for distribution or use on the Union market in the course of a commercial activity, whether in return for payment or free of charge.	Article 3(1), point (17).
Placing on the market	The first making available of a battery on the Union market.	Article 3(1), point (16).
Putting into service	The first use, for its intended purpose in the Union, of a battery that has not previously been placed on the market.	Article 3(1), point (18).
End-user	A person in the Union to whom a product has been made available, either as a consumer outside any trade, business, craft or profession, or as a professional end-user in the course of industrial or professional activities.	Article 3(2)(b) of the Regulation, which takes the term from Article 3 of Regulation (EU) 2019/1020.
Market surveillance authority	An authority designated by a Member State as responsible for carrying out market surveillance in its territory.	Article 3(2)(b) of the Regulation, which takes the term from Article 3 of Regulation (EU) 2019/1020.
Notified body	A conformity assessment body that has been notified under Chapter V of the Regulation.	Article 3(1), point (41).
Conformity assessment	The process demonstrating whether the sustainability, safety, labelling, information and due diligence requirements of the Regulation have been fulfilled.	Article 3(1), point (39).
CE marking	A marking by which a manufacturer indicates that the battery is in conformity with the applicable requirements in Union harmonisation legislation providing for its affixing.	Article 3(1), point (36).
Battery model	A version of a battery all units of which share the same technical characteristics relevant for the Regulation's requirements on sustainability, safety, labelling, marking and information, and the same model identifier.	Article 3(1), point (19).
Battery cell	The basic functional unit in a battery, composed of electrodes, electrolyte, container, terminals and, if applicable, separators, and containing the active materials the reaction of which generates electrical energy.	Article 3(1), point (4).
Battery module	A set of battery cells connected together or encapsulated within an outer casing to protect them against external impact, meant to be used alone or in combination with other modules.	Article 3(1), point (3).
Active material	A material which reacts chemically to produce electric energy when the battery cell discharges, or to store electric energy when the battery is being charged.	Article 3(1), point (5).
Rechargeable and non-rechargeable battery	A battery that is, or is not, designed to be electrically recharged.	Article 3(1), points (6) and (7).
Battery with exclusively external storage	A battery specifically designed to have its energy stored exclusively in one or more attached external devices.	Article 3(1), point (8).
Battery management	An electronic device that controls or manages the electric and	Article 3(1), point (25).

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Term	Meaning	Source
system	thermal functions of a battery to ensure its safety, performance and service life, manages and stores the data for the state-of-health and expected-lifetime parameters in Annex VII, and communicates with the vehicle, light means of transport or appliance in which the battery is incorporated, or with a public or private charging infrastructure.	
State of health	A measure of the general condition of a rechargeable battery and its ability to deliver the specified performance compared with its initial condition.	Article 3(1), point (28).
Independent operator	A person independent from the manufacturer and the producer and directly or indirectly involved in the repair, maintenance or repurposing of batteries, including waste management operators and repairers.	Article 3(1), point (23).
Hazardous substance	A substance classified as hazardous under Article 3 of Regulation (EC) No 1272/2008.	Article 3(1), point (52).
Homogeneous material	A term used in Annex I for some limits by weight. How it applies to a battery is an open question (OQ-REG-016).	Annex I, entries 2–4.
Waste battery	A battery that is waste as defined in Article 3, point (1), of Directive 2008/98/EC.	Article 3(1), point (50).
Waste management operator	A person dealing on a professional basis with the separate collection or treatment of waste batteries.	Article 3(1), point (56).
Treatment	An operation carried out on waste batteries after they have been handed over to a facility for sorting, preparation for re-use, preparation for repurposing, preparation for recycling or recycling.	Article 3(1), point (53).
Recycler	A person who carries out recycling in a permitted facility.	Article 3(1), point (58).
Recycling efficiency	The ratio, as a percentage, obtained by dividing the mass of output fractions accounting for recycling by the mass of the waste batteries' input fraction.	Article 3(1), point (60).
Black mass	A powder of electrode materials produced when batteries are processed for recycling. For the recycling calculations it is an intermediate fraction, not an output fraction.	Delegated Regulation (EU) 2025/606, Annex, sections 1 and 3, for its status. The description of the powder is its general technical meaning.
C-rate	The rate of charge or discharge relative to the capacity of the battery. At 1C, a battery charges or discharges fully in one hour.	General technical meaning. Annex XIII, point 1(p), uses the term without defining it.
Battery due diligence	An economic operator's obligations on its management system, risk management, third-party verification and disclosure, to identify, prevent and address social and environmental risks linked to the raw materials for battery manufacturing.	Article 3(1), point (42).
Vehicle categories L, M, N and O	L: two- and three-wheel vehicles and quadricycles. M: passenger vehicles, with M1 up to eight seats plus the driver. N: goods vehicles, with N1 up to 3.5 tonnes. O: trailers.	Regulations (EU) No 168/2013 (L) and (EU) 2018/858 (M, N and O).

16.3 Roles

Term	Meaning	Source
Economic operator	A manufacturer, authorised representative, importer, distributor, fulfilment service provider or another person subject to obligations concerning the manufacture or circular processing of batteries, their making available or placing on the market, including online, or their putting into service.	Article 3(1), point (22). The actor responsible for a particular duty must be determined from the operative provision; the general definition does not assign every duty to every economic operator.
Manufacturer	A person that manufactures a battery, or has a battery designed or manufactured, and markets it under its own	Article 3(1), point (33). A manufacturer is not necessarily the "producer" for every

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Term	Meaning	Source
	name or trademark or puts it into service for its own purposes.	Member State.
Authorised representative	A person established in the Union that has a written mandate from a manufacturer to act on its behalf for specified tasks concerning the manufacturer's obligations under Chapters IV and VI of the Regulation.	Article 3(1), point (63). This role is distinct from an authorised representative for extended producer responsibility under Article 3(1), point (48).
Importer	A person established in the Union that places on the market a battery from a third country.	Article 3(1), point (64).
Distributor	A person in the supply chain, other than the manufacturer or importer, that makes a battery available on the market.	Article 3(1), point (65).
Producer	A manufacturer, importer, distributor or other person that meets one of the Member-State-specific first-supply or distance-selling conditions in Article 3(1), point (47), including for batteries incorporated in appliances, light means of transport or other vehicles.	Article 3(1), point (47). This concise definition must be applied with all four alternatives in points (a)–(d); it is not a synonym for manufacturer.
Fulfilment service provider	A person handling warehousing, packaging, addressing and dispatching, as set out in chapter 3.	Article 3(2)(b) of the Regulation, which takes the term from Article 3 of Regulation (EU) 2019/1020; Article 43.
Authorised representative for extended producer responsibility	A person established in a Member State where the producer places batteries on the market, other than the producer's own, appointed by the producer to fulfil its obligations under Chapter VIII of the Regulation.	Article 3(1), point (48).
Producer responsibility organisation (PRO)	A legal entity that financially, or financially and operationally, organises the fulfilment of extended producer responsibility obligations on behalf of several producers.	Article 3(1), point (49).

16.4 GS1 terms

Term	Meaning	Source
GTIN	GS1 identification key that identifies a trade item. A GTIN alone does not identify an individual battery instance.	GS1 General Specifications, section 1.3.1, p. 35. Whether the battery, a host product or both are trade items requiring separate identification depends on the implementation scope.
GTIN plus batch/lot number	GS1 identification structure that distinguishes a production batch/lot of a trade item.	GS1 General Specifications, section 1.3.1.2, p. 37. Batch-level identification does not identify an individual instance.
GTIN plus serial number	GS1 identification structure that distinguishes an individual instance of a trade item.	GS1 General Specifications, section 1.3.1.4, p. 39. Allocation and lifecycle governance remain necessary.
GLN	GS1 identification key that identifies a legal entity, party, function or location.	GS1 General Specifications, sections 1.3.3–1.3.4, pp. 49–54. A GLN does not replace an authority-issued registration number or other legally issued identifier, but complements and links to it.
SSCC	GS1 identification key that identifies a logistic unit.	GS1 General Specifications, section 1.3.5, pp. 55–56. It does not identify each battery contained in the logistic unit.
GS1 Application Identifier	A numeric code that defines the meaning and format of the data element that follows it in a GS1 element string.	GS1 General Specifications, section 3, pp. 201–276. Relevant examples include AI (01) for GTIN, AI (10) for batch/lot number and AI (21) for serial number.
GS1 Digital Link URI	A URI representation of a GS1 identifier and, where applicable, its key qualifiers and data attributes. It provides web-enabled identification and an entry point to online resources associated with the identified object.	GS1 Digital Link Standard: URI Syntax, sections 3.1 and 4, pp. 18–36. A URI, resolver or linked webpage is not by itself a battery passport and does not satisfy the passport's data, access, persistence, security or governance requirements.
Link type	A term from the GS1 Web Vocabulary that describes the kind of resource a resolver links to, such as `gs1:dpp` (Digital Product Passport) or	GS1 Web Vocabulary, version 1.18. This guideline recommends `gs1:dpp` for the passport route and `gs1:pip` for the non-passport route (chapter 7).

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Term	Meaning	Source
	`gs1:pip` (Product Information Page).	
EPCIS	GS1 standard for capturing and sharing visibility event data concerning identified objects and business processes.	GS1 EPCIS Standard, version 2.0.1, sections 1, 6 and 7, pp. 21–102. EPCIS records do not prove regulatory compliance or replace conformity assessment, verification, certification, audit or an authority decision.
GDSN	GS1 network for standardised trade-item master-data exchange.	Use is subject to verification that current attributes, validations and target-market implementation cover the intended battery data. GDSN must not be presented as covering every regulatory data element until that mapping has been verified.
Trade item	A product for which predefined information needs to be retrieved and that may be priced, ordered or invoiced at a point in the supply chain.	Chapter 6 explains how it is used.
Logistic unit	A pallet, case, cage, container or similar unit assembled for transport or storage.	SSCC identifies it (chapter 6).

16.5 Abbreviations

Abbreviation	Meaning
AI	Application Identifier
API	Application programming interface
CBV	Core Business Vocabulary
CE	Conformité Européenne
CTE	Critical Tracking Event
EDI	Electronic Data Interchange
EPCIS	Electronic Product Code Information Services
EPR	Extended producer responsibility
EU	European Union
EV	Electric vehicle
EWC	European Waste Catalogue
GDSN	Global Data Synchronisation Network
GLN	Global Location Number
GTIN	Global Trade Item Number
KDE	Key Data Element
LMT	Light means of transport
PRO	Producer responsibility organisation
QR	Quick Response
SLI	Starting, lighting and ignition
SSCC	Serial Shipping Container Code
URI	Uniform Resource Identifier
WEEE	Waste electrical and electronic equipment

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