Circulor

The leading provider for supply chain traceability and DPPs

EU BATTERY REGULATION 2023/1542

What's in a Battery Passport?

The definitive guide to the mandatory data requirements for every EV, LMT, industrial and stationary Battery Passport under Regulation (EU) 2023/1542.

Executive Summary

The Battery Passport is the mandatory Digital Product Passport for every regulated battery placed on the EU market from February 2027. Here is what it must contain, who can access it, and when it takes effect.

KEY TAKEAWAY

Under Article 77 of the EU Battery Regulation, every EV battery, LMT battery, industrial battery above 2 kWh, and stationary battery above 2 kWh sold in the EU must carry a unique **Battery Passport** accessible via a QR code on the battery itself.

The Battery Passport must contain approximately 90 data attributes across seven content clusters: identifiers, conformity, carbon footprint, due diligence, materials, circularity, and performance. Attributes are assigned to one of four access tiers; public, legitimate interest or commission.

REGULATION	IN EFFECT	COVERED	ACCESS TIERS
2023/1542	Feb 2027	4	4
EU Battery Regulation, in force since Aug 2023	Battery Passport becomes mandatory	Battery categories: EV, LMT, Industrial >2kWh, Stationary >2kWh	Public, legitimate interest, Commission, market surveillance

What is a Battery Passport?

A **Battery Passport** is a digital record: a specific form of Digital Product Passport (DPP) containing standardised, machine-readable data about a battery's identity, composition, carbon footprint, supply chain, performance, and end-of-life handling. It is linked to an individual battery through a QR code printed on the product itself, and the data behind that code persists for the battery's entire lifecycle and for 10 years after end of life.

The Battery Passport is mandated by **Regulation (EU) 2023/1542**, known as the EU Battery Regulation, which entered into force on 17 August 2023 and replaces the previous Battery Directive (2006/66/EC).
From **18 February 2027**, no covered battery may be placed on the EU market without a compliant Battery Passport.

The Battery Passport is the first live implementation of the EU's wider Digital Product Passport framework, batteries are the test case for every regulated product that follows.

Mandatory Data Attributes

Everydata attribute requiredin a compliant Battery Passport, grouped by the seven content clusters defined in DIN DKE Spec 99100 and the Battery Regulation's Annex XIII. An × indicates the attribute is mandatory for that battery category.

× Mandatory — Not required ■ Static ■ Dynamic

DATA ATTRIBUTE	EV	LMT	IND. >2KWH	S TAT. >2KWH	ACCESS	TYPE
Identifiers & product data 8–9 mandatory attributes						
Battery identifier (unique serial, QR-linked)	×	×	×	×	Public	Static
Manufacturer identifier & information	×	×	×	×	Public	Static
Manufacturing place	×	×	×	×	Public	Static
Manufacturing date (month & year)	×	×	×	×	Public	Static
Warranty period	×	×	×	×	Public	Static
Battery category	×	×	×	×	Public	Static
Battery mass	×	×	×	×	Public	Static
Date of putting battery into service	—	×	—	×	Legit. interest	Static
Battery status (original / repurposed / waste)	×	×	×	×	Legit. interest	**Dynamic**
Symbols, labels & documentation of conformity 6 mandatory attributes						
Separate collection symbol	×	×	×	×	Public	Static
Symbols for cadmium & lead (if applicable)	×	×	×	×	Public	Static
Extinguishing agent	×	×	×	×	Public	Static
Meaning of labels & symbols	×	×	×	×	Public	Static
EU declaration of conformity	×	×	×	×	Public	Static
Test reports proving compliance	×	×	×	×	Notified bodies	Static
Battery carbon footprint 8 mandatory attributes						
Total carbon footprint per functional unit (kg CO_2-eq / kWh)	×	×	×	×	Public	Static
CF contribution — raw material acquisition & pre-processing	×	×	×	×	Public	Static
CF contribution — main product manufacturing	×	×	×	×	Public	Static
CF contribution — distribution	×	×	×	×	Public	Static
CF contribution — end of life & recycling	×	×	×	×	Public	Static
Carbon footprint performance class	×	×	×	×	Public	Static
Web link to public carbon footprint study	×	×	×	×	Public	Static
General battery & manufacturer information	×	×	×	×	Public	Static

Mandatory Data Attributes (continued)

DATA ATTRIBUTE	EV	LMT	IND. >2KWH	S TAT. >2KWH	ACCESS	TYPE
Supply chain due diligence 1 mandatory attribute						
Due diligence report (cobalt, lithium, nickel, natural graphite)	×	×	×	×	Public	Static
Battery materials & composition 5 mandatory attributes						
Battery chemistry	×	×	×	×	Public	Static
Critical raw materials (>0.1% w/w)	×	×	×	×	Public	Static
Materials in cathode, anode, electrolyte	×	×	×	×	Legit. int. + Comm.	Static
Hazardous substances	×	×	×	×	Public	Static
Impact of substances on environment & health	×	×	×	×	Public	Static
Circularity & resource efficiency 16 mandatory attributes						
Dismantling manuals (pack disassembly)	×	×	×	×	Legit. int. + Comm.	Static
Part numbers for components	×	×	×	×	Legit. int. + Comm.	Static
Sources of spare parts	×	×	×	×	Legit. int. + Comm.	Static
Safety measures	×	×	×	×	Legit. int. + Comm.	Static
Pre-consumer recycled share — nickel	×	×	×	×	Public	Static
Pre-consumer recycled share — cobalt	×	×	×	×	Public	Static
Pre-consumer recycled share — lithium	×	×	×	×	Public	Static
Pre-consumer recycled share — lead	×	×	×	×	Public	Static
Post-consumer recycled share — nickel	×	×	×	×	Public	Static
Post-consumer recycled share — cobalt	×	×	×	×	Public	Static
Post-consumer recycled share — lithium	×	×	×	×	Public	Static
Post-consumer recycled share — lead	×	×	×	×	Public	Static
Renewable content share	×	×	×	×	Public	Static
End-user role in waste prevention	×	×	×	×	Public	Static
End-user role in separate collection	×	×	×	×	Public	Static
Battery collection, second life & end-of-life treatment	×	×	×	×	Public	Static

Mandatory Data Attributes (continued)

DATAATTRIBUTE	EV	LMT	IND. >2KWH	S TAT. >2KWH	ACCESS	TYPE
Performance & durability 25–34 mandatory attributes						
Rated capacity	×	×	×	×	Public	Static
Capacity fade	×	×	×	×	Legit	Static
State of Certified Energy (SOCE)	×	×	×	×	Legit interest	**Dynamic**
State of Charge (SoC)	×	×	×	×	Legit interest	**Dynamic**
Nominal, minimum & maximum voltage	×	×	×	×	Public	Static
Original power capability & power fade	×	×	×	×	Public / Legit int.	Static
Maximum permitted battery power	×	×	×	×	Public	Static
Initial round-trip energy efficiency	×	×	×	×	Public	Static
Round-trip efficiency at 50% of cycle life	×	×	×	×	Public	Static
Energy round-trip efficiency fade	×	×	×	×	Legit interest	Static
Initial internal resistance (cell & pack)	×	×	×	×		Static
Internal resistance increase	×	×	×	×	Public	Static
Expected lifetime — calendar years	×	×	×	×	Legit. interest	Static
Expected lifetime — charge/discharge cycles	×	×	×	×	Legit. interest	Static
Number of full charging/discharging cycles (actual)	×	×	×	×	Public	**Dynamic**
Cycle-life reference test & C-rate	×	×	×	×	Legit. interest	Static
Capacity threshold for exhaustion	×	×	×	×	Public	Static
Temperature information (operational)	×	×	×	×	Public	**Dynamic**
Temperature range idle state (upper & lower)	×	×	×	×	Legit. interest	Static
Information on accidents / negative events	×	×	×	×	Public	**Dynamic**
					Legit. interest	

Source: Battery Pass Consortium Data Attribute Longlist v1.2 (January 2025), based on Regulation (EU) 2023/1542 and DIN DKE Spec 99100. LMT and stationary battery categories require additional performance & durability attributes; the performance block above shows the core set mandatory across all four battery types. Attribute names are abbreviated for readability; full definitions sit in Annex VI, Annex VII, Annex VIII, and Annex XIII of the regulation.

Who can see what — the four access tiers

Not every attribute in the Battery Passport is public. Article 77 and Annex XIII of the EU Battery Regulation define four access groups, and each data point is assigned to exactly one.

- **Public** — accessible to anyone who scans the QR code. Includes identifiers, carbon footprint, chemistry, recycled content, and high-level performance data.
- **Persons with a legitimate interest** — repairers, remanufacturers, second-life operators, recyclers. Access dynamic operational data such as State of Charge, temperature, capacity fade, and dismantling manuals.
- **Persons with a legitimate interest and the European Commission** — extends the above to include the Commission for policy and enforcement purposes.
- **Notified bodies, market surveillance authorities and the Commission** — the most restricted tier. Contains conformity test reports and other audit evidence.

This tiered model is what makes the Battery Passport architecturally different from a simple product spec sheet. It is a **permissioned data system,** closer to an identity wallet than a website. Each scan of the QR code resolves to a different view of the data depending on who is scanning.

Static vs. dynamic data

Most Battery Passport attributes are **static;** set at the moment the battery is placed on the market and only updated if the battery is physically modified or repurposed. Manufacturer name, chemistry, carbon footprint, and rated capacity fall in this group.

A smaller set of attributes is **dynamic** and must be updated throughout the battery's life. These include State of Charge (SoC), State of Certified Energy (SOCE), actual cycle count, operational temperature history, battery status changes (original → repurposed → waste), and recorded accidents or negative events. The exact update cadence for dynamic data will be specified in a delegated act under Article 77(2).

For battery manufacturers and OEMs, the dynamic-data requirement is the operationally hardest part of compliance: it forces a live connection between the battery management system (BMS), a telematics or cloud layer, and the Battery Passport data registry.

Granularity: pack, module, cell

The current Battery Regulation mandates reporting on the highest level, usually the battery pack for EV and industrial batteries, or a stand-alone module for LMT batteries. More granular reporting at module or cell level is optional today but increasingly expected to convey varying information within a battery pack, particularly for second-life assessment.

Who is responsible for the Battery Passport?

The economic operator placing the battery on the EU market is legally responsible for creating the Battery Passport and ensuring its data is accurate and kept up to date.

In practice, this is usually the battery manufacturer or the OEM integrating the battery into a vehicle or storage system. Responsibility can transfer when the battery changes status, for example, when a battery is repurposed for second life, the repurposing operator becomes responsible for updating the battery status, new performance parameters, and ownership of the Battery Passport record.

Data must comply with **ISO/IEC 15459** for unique identifiers and remain accessible for the entire lifetime of the battery plus 10 years after end of life.

Covered battery categories

- **Electric vehicle (EV) batteries** — traction batteries for passenger cars, vans, trucks, buses.
- **Light means of transport (LMT) batteries** — E-bikes, E-scooters, E-mopeds.
- **Industrial batteries above 2 kWh** — batteries for industrial equipment excluding stationary storage.
- **Stationary battery energy storage systems above 2 kWh** — grid-scale and behind-the-meter storage.

Compliance timeline

17 August 2023	Regulation (EU) 2023/1542 enters into force, replacing the Battery Directive 2006/66/EC.
18 February 2025	Supply chain due diligence obligations begin for large economic operators.
18 August 2025	Carbon footprint declaration required for EV batteries.
18 February 2027	Battery Passport becomes mandatory. Every EV, LMT, industrial >2kWh, and stationary >2kWh battery placed on the EU market from this date must carry a compliant Battery Passport.
2028 onwards	Maximum carbon footprint thresholds and minimum recycled content thresholds begin to apply progressively.

Frequently Asked Questions

Common questions about the Battery Passport, its scope, and its operational implications.

Is the Battery Passport the same as a Digital Product Passport?

The Battery Passport is a specific, battery-industry implementation of the broader Digital Product Passport (DPP) concept introduced by the EU's Ecodesign for Sustainable Products Regulation (ESPR). It is the first DPP to reach mandatory status and sets the template for all future DPPs.

Which batteries need a Battery Passport?

All EV batteries, LMT (light means of transport) batteries, industrial batteries with capacity above 2 kWh, and stationary battery energy storage systems above 2 kWh placed on the EU market from 18 February 2027 onwards.

How many data attributes does a Battery Passport contain?

Approximately 90 data attributes defined by the EU Battery Regulation and the DIN DKE Spec 99100. The exact count per battery varies by category; EV batteries require around 69 mandatory attributes, stationary batteries above 2 kWh require around 77.

How is the Battery Passport accessed?

Through a data carrier, in practice a QR code printed directly on the battery. Scanning links to a persistent unique identifier, which resolves to a decentralised or federated data service where Battery Passport attributes are stored per the relevant access tier.

What happens if a manufacturer does not comply?

Member states set penalties for non-compliance with the Battery Regulation. A non-compliant battery cannot legally be placed on the EU market, meaning supply into the single market is effectively blocked. Enforcement sits with national market surveillance authorities.

Who owns the Battery Passport data?

The economic operator that places the battery on the market is the responsible party for creating and maintaining the Battery Passport. Data ownership itself is not uniformly defined in the regulation and depends on commercial contracts between battery manufacturers, OEMs, fleet operators, second-life operators, and recyclers.

How long must Battery Passport data be kept?

For the entire operational lifetime of the battery, plus 10years after end of life. This long retention period reflects the regulatory intent that the Battery Passport supports second-life assessment, recycling, and long-term materials circularity.

GET BATTERY PASSPORT READY

Circulor delivers the data infrastructure behind compliant Battery Passports.

As the leading provider of supply chain traceability and Digital Product Passports, Circulor helps to capture, verify, and publish every Battery Passport attribute.

circulor.com

Sources: Regulation (EU) 2023/1542 · DIN DKE Spec 99100 · Battery Pass Consortium Data Attribute Longlist v1.2 (January 2025)