UNIFE Battery Passport factsheet

October 2026

About UNIFE

UNIFE, the *European Rail Supply Industry Association*, has operated in Brussels since 1992, representing European train builders and rail equipment suppliers. The association advocates for more than 120 of Europe's leading rail supply companies – from SMEs to major industrial champions – active in designing, manufacturing, maintaining and refurbishing rail transport systems (trains, metros, trams, freight wagons), subsystems and related equipment. UNIFE also brings together national rail industry associations from 13 European countries.

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Clarification Request Regarding the Commission Guidance on Digital Battery Passport Data Requirements Under Regulation (EU) 2023/1542

The European Commission published **a guidance document setting out the data points** (version 2.0 released on 15 August 2026) associated with the Battery Passport for Electrical vehicles (EVs), Light Means of Transport (LMTs) and, **most crucial for the rail supply industry, industrial batteries with a capacity greater than 2 kWh, under Regulation (EU) 2023/1542**.

UNIFE wishes to develop a common understanding within the rail supply industry and has prepared this document to help the industry **identify which information is mandatory, optional, applicable only in certain cases, or not required** to be filled in or displayed as of February 2027. This document lists the information the rail supply industry must collect, manage, and make available through the Battery Passport.

Synthesis

Data point name	Guidance applicability	**UNIFE position** regarding industrial batteries for railway sector
Static data points		
(36) *Initial round-trip energy efficiency*	Some industrial batteries	Not applicable yet
(37) *Round-trip energy efficiency at 50% of cycle life*	Some industrial batteries	Not applicable yet
(39) *C-rate of the relevant cycle-life test*	Some industrial batteries	Not applicable yet
Specific document (carbon footprint declaration, due diligence report…)	-	European Commission to provide template for each specific document
Usage/Dynamic data points		
(57) *Where applicable, energy round-trip efficiency (in %)*	If Applicable	Not applicable
(58) *Where applicable, energy round-trip efficiency fade (in %)*	If Applicable	Not applicable
(59) *The expected lifetime of the battery under reference conditions for which it has been designed, in terms of cycles, except for non-cycle applications*	If Applicable	Not applicable
(62) *Information on the state of health of the battery pursuant to Article 14: remaining capacity*	If Applicable	Not Applicable
(63) *Information on the state of health of the battery pursuant to Article 14: where possible, the remaining power capability*	If Applicable	Not Applicable
(64) *Information on the state of health of the battery pursuant to Article 14: where possible, the remaining round-trip efficiency*	If Applicable	Not Applicable

(65) *Information on the state of health of the battery pursuant to Article 14: where possible, the evolution of self-discharging rates*	If Applicable	Not Applicable
(66) *Information on the state of health of the battery pursuant to Article 14: where possible, the ohmic resistance*	If Applicable	Not Applicable
(68) *The number of charging and discharging cycles*	If Applicable	Not Applicable
Periodically recorded information (on change of status)		
(70) *Periodically recorded information on the operating environmental conditions, including temperature*	If Applicable	Maximum and minimum temperatures experienced by the battery over its lifetime
(71) *Periodically recorded information on the state of charge*	If Applicable	Not Applicable

1) Data points related to the Battery Model (Static)

Based on the European Commission's guidance and an interpretation of Regulation (EU) 2023/1542, **UNIFE considers the data points related to the battery model to be, by definition, static**. As this information is associated with the battery model and therefore common to all batteries placed on the market under that model, these data points are **not expected to change throughout the model's lifecycle**. Consequently, they **should be completed before placing the battery model on the market and should not require subsequent updates**.

The guidance document identifies the following three static data points as applicable only to "*some industrial batteries*":

- (36) *Initial round-trip energy efficiency*;
- (37) *Round-trip energy efficiency at 50% of cycle life*;
- (39) C-*rate of the relevant cycle-life test*.

Because the European Commission's guidance does not further specify the scope of applicability, UNIFE notes that **static data points should include information linked to the battery model and therefore common to all batteries placed on the market under that model, based on representative charge and discharge conditions**.

The same battery model may be installed on different types of trains operating on different routes and under significantly different operating conditions. **Without a standard defining the relevant C-rate for different route types and applications, even static values will vary considerably between manufacturers depending on the applied model**. Hence, values will not be comparable.

As such, these data points should be regarded as not applicable for industrial batteries.

- Several documents are required to be made available through the Digital Battery Passport and are primarily linked to the battery model.

As is already the case for the EU Declaration of Conformity, **UNIFE considers that the European Commission should develop harmonised templates for the documents listed below**. Using common templates would promote consistency across the market, facilitate data exchange, and avoid unnecessary administrative burden for manufacturers and other economic operators, who would otherwise need to develop and maintain their own document formats and digital integration processes.

- Carbon footprint declaration
- Due diligence report
- Third-party verification reports
- Battery carbon footprint declaration per kWh
- Carbon footprint per the full life cycle (%)
- Pre-consumer recycled share
- Post-consumer recycled share
- Performance and Durability data

2) Data points related to Individual Battery (Dynamic/Usage data)

According to the Commission's guidance document and UNIFE's understanding of Regulation (EU) 2023/1542, **data points relating to individual batteries should be considered as usage-related data**. At the time of placing a battery on the market, no operational data has yet been generated. Consequently, these usage-related fields are expected to remain empty until the battery enters service and relevant operational information becomes available. **The first update should then occur at the first battery status change.**

Several aspects of the guidance document relating to these usage data points would benefit from further modification. In particular, several data points are identified as applying to industrial batteries "*if applicable*", with reference to Annex XIII (4). **UNIFE would welcome modifying the term "*if applicable*" in this context.**

- For repairers and recyclers, *Rated Capacity* (51), *Capacity Fade* (52), *Power* (53), *Power Fade* (54*), Internal Resistance* (55) and *Internal Resistance Increase* (56) provide essential information regarding the battery's condition and remaining value. **However, *Energy Round Trip Efficiency* (57) and *Energy Round Trip Efficiency Fade* (58), while relevant, require complete and representative charge and discharge cycles to be determined accurately**.

In railway traction applications, depth of discharge is often limited, and operating profiles generally lack clearly identifiable charge and discharge cycles. Furthermore, identical battery systems may be used on different types of trains, operating on different routes and under significantly different driving cycles. Because these operational conditions strongly influence Energy Round Trip Efficiency (RTE), a dynamic RTE value may vary substantially over the battery's lifetime, depending on route, train type, and charge and discharge cycles. Hence, the value will be extremely imprecise and only approximate. Moreover, the train operator typically owns this data, and obtaining it may be challenging for the economic operator under the Battery Regulation. After ownership transfer, the rail manufacturer no longer has physical access to the rail vehicle unless it has a maintenance contract with the operator. Consequently, such values may not provide a robust or representative basis for comparison across railway applications. Because the data is not robust, representative, or comparable for railway applications, **UNIFE considers data points 57 and 58, currently indicated as "*if applicable*" in the EU Commission's guidance, as "*not applicable*" for the railway industry.**

- Similarly, data point (68), "*The number of charging and discharging cycles*", raises data access challenges for industrial traction batteries.

As mentioned above, this data is typically owned by the train operator, and obtaining it may be challenging for the economic operator under the Battery Regulation. After the transfer of ownership, the rail manufacturer no longer has physical access to the rail vehicle if it does not have a maintenance contract with the operator. Consequently, **UNIFE considers data point 68 currently indicated as "if applicable" in the European Commission's guidance, as "*not applicable*" for the railway industry.**

- The following data points (59 and 62 to 66) are also identified in the guidance document as applicable to industrial batteries "if applicable", based on Annex XIII(4)(b):
    - The expected lifetime of the battery under reference conditions for which it has been designed, in terms of cycles, except for non-cycle applications
    - Information on the state of health of the battery pursuant to Article 14: remaining capacity

- Information on the state of health of the battery pursuant to Article 14: where possible, the remaining power capability
- Information on the state of health of the battery pursuant to Article 14: where possible, the remaining round-trip efficiency
- Information on the state of health of the battery pursuant to Article 14: where possible, the evolution of self-discharging rates
- Information on the state of health of the battery pursuant to Article 14: where possible, the ohmic resistance

However, Annex XIII(4)(b) states that the Digital Battery Passport shall include "*information on the state of health of the battery pursuant to Article 14*". Article 14 appears to apply only to stationary battery energy storage systems, LMT batteries and electric vehicle batteries: "*From 18 August 2024, up-to-date data for the parameters for determining the state of health and expected lifetime of batteries as set out in Annex VII shall be contained in the battery management system of stationary battery energy storage systems, LMT batteries and electric vehicle batteries*."

Based on UNIFE's understanding of Article 14, **these requirements do not appear to apply to industrial batteries, and the current wording of the guidance may therefore create ambiguity regarding their applicability**. **All data points that are based on the state of health (Art. 14) should not apply to industrial batteries.**

3) Periodically recorded information related to Individual Battery (Dynamic/Usage data)

UNIFE suggests modifications to two periodic data points related to operating environmental conditions and state of charge, as their intended scope and implementation are not fully understood.

- Data point 70 requires information on the operating environmental conditions, including temperature. UNIFE understands that this requirement could imply reporting the environmental temperature surrounding the battery during operation. However, the battery itself generally does not measure this information directly and would typically require additional sensors or external data sources.

From a practical implementation perspective, it is unclear whether the intention is to report external environmental conditions or battery temperature measurements already monitored by the Battery Management System (BMS). **UNIFE suggests that the maximum and minimum temperatures experienced by the battery over its lifetime be reported instead**.

- Data point 71, "*Periodically recorded information on the state of charge*", raises questions regarding its relevance for industrial traction batteries.

In the railway sector, before removing a battery from a vehicle for maintenance, repair, or end-of-life treatment, the operator must manually determine and communicate the battery's state of charge for safety and EHS purposes. This information is typically obtained directly from the train control system or from the battery itself through dedicated communication interfaces. Furthermore, when batteries are transferred to third parties for repair, refurbishment, recycling or transportation, the state of charge, which may change over time depending on storage and transport conditions, and the battery's integrity status must be accessed and communicated at the time of transfer.

Relying on periodically recorded State of Charge information could create a misleading perception of the actual battery condition at the time of handling. For safety reasons, operators, repairers and recyclers should always verify the current State of Charge directly from the battery or the associated system before any maintenance, transportation or recycling operation.

If the European Commission decides to retain this data point for industrial traction batteries, **UNIFE suggests providing this information only when the battery status changes and recommends timestamping the value to improve the reliability of the information**. The operator must manually check this value before handling the battery. Once out of service, values will change unpredictably in any case. **UNIFE nevertheless considers that data point 71 should not be applicable to industrial traction batteries.**