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Anforderungen an Datenattribute des Batteriepasses; Text Englisch

Requirements for data attributes of the battery passport;
Text in English

Exigences relatives aux attributs de données du passeport de la batterie;
Texte en anglais

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Foreword

This DIN DKE SPEC has been developed according to the PAS procedure. The development of a DIN SPEC according to the PAS procedure is carried out in DIN SPEC-consortiums and does not require the participation of all stakeholders.

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Battery Pass

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Introduction

Batteries are a pivotal element for the transition to low-carbon mobility and renewable energy. In this context, safety and sustainability of battery production and batteries is crucial to its impact. To this cause the European Union passed a new legislation, the EU Battery Regulation (EU) 2023/1542 on Batteries and waste batteries, which entered into force on 17 August 2023, and is intended to nurture a sustainable and responsible circular economy. It introduces a battery passport as a core instrument for documenting and exchanging a comprehensive set of data along the entire battery value chain through a digital infrastructure. The systemic approach to transparency enables responsible material sourcing, more sustainable production, as well as efficient and effective second-life and end-of-life management and processes. The battery passport serves as a key pioneering application of digital product passports for other sectors. BattReg Article 77(1) states that from 18 February 2027, each LMT battery, each industrial battery > 2 kWh and each electric vehicle (EV) battery placed on the market or put into service must have an electronic record, called the battery passport.

The Battery Regulation (EU) 2023/1542 declares to specify detailed provisions in delegated and implementing acts which are to be issued in due time, see 5.1. In addition, European standards are currently developed and drafted in the framework of the standardisation requests M/579 on performance, safety and sustainability requirements for batteries and on the digital product passport system. Therefore, the user of this DIN DKE SPEC is advised to inform himself/herself about current regulations and standards before applying this document.

This document transfers the actual and anticipated legal requirements into definitions of data points and provides a guidance for application to responsible economic operators implementing the battery passport. As a central piece of information, this document addresses also other battery value chain participants requested to report and/or intending to access battery passport information. The requirements given are reflecting current best knowledge and might be subject to change due to further delegated and implementing acts issued in due course. In addition to the requirements mandated by the EU Battery Regulation, this document builds on the Ecodesign for Sustainable Products Regulation and further regulatory requirements to highlight the harmonisation need.

Therefore, the document contains value-adding aspects and recommendations on data points necessary to practically achieve the intent of the regulation increasing sustainability and circularity ensuring a reasonable balancing of sustainability objectives and industry feasibility.

Guidance on data attributes for battery passport required by the Battery Regulation are informatively listed in Clause 5 and Clause 6 and indicated with “must”, whenever these requirements are adopted from the BattReg. The individual references to BattReg for each attribute can be found in Annex D, Table D.1. Additional requirements and recommendations to conform with this DIN DKE SPEC, which are neither stated by the BattReg nor contradictory to latter, are indicated with “shall (not)” and “should (not)” respectively.

The elaborations of this document are supposed to serve as a foundation of internationally applicable standards enabling worldwide interoperability. This document shall support participants of the battery value chain to prepare for their individual data contribution to the battery passport with foresight in view of the, yet, incomplete set of delegated and implementing acts.

This document supports the responsible economic operators to prepare for the implementation of the battery passport mandatory by 18 February 2027 (see BattReg Article 77(1)). This document addresses therefore all economic operators who are subject to obligations in relation to the battery passport in accordance with the current status of EU Battery Regulation. This document will be revised after the competent and National Bodies will have completed the legislative procedures including delegated and implementing acts.

1 Scope

In the context of a digital product passport for batteries (short: battery passport), this document gives guidance for battery passport data attributes. The guidance is based on the European Union and key Member States current regulatory requirements for battery passport information. Mandatory information for the battery passport as stated in the EU Battery Regulation (EU) 2023/1542, Article 77 and Annex XIII, as well as the Ecodesign for Sustainable Products Regulation (ESPR), is supplemented by recommendations to increase sustainability and circularity.

This document refers to the battery categories covered by the EU Battery Regulation. The battery categories – irrespective of the battery chemistry – that must have a battery passport as electronic record are specified in the Battery Regulation Article 77(1)/Article 3 and include:

— light means of transport (LMT) batteries;

— industrial batteries > 2 kWh; and

— electric vehicle batteries.

Batteries with external storage (particularly flow batteries) are excluded from the scope of this document but might require a battery passport as well.

This document includes general information for the implementation and an overview on the data attributes including battery category-specific requirements and units, the access of different groups of stakeholders to the battery passport information, requirements on physical labelling.

The specified data attributes for the battery passport are elaborated and grouped into the following content clusters:

— identifiers and product data;

— symbols, labels and documentation of conformity;

— battery carbon footprint;

— supply chain due diligence;

— battery materials and composition;

— circularity and resource efficiency;

— performance and durability.

As the document focuses on the data attributes, it excludes technical requirements for the architecture of the digital “operating system” of the battery passport, which are addressed within the working group CEN/CLC/JTC 24.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 15459-1:2014, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 1: Individual transport units*

ISO/IEC 15459-2:2015, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 2: Registration procedures*

ISO/IEC 15459-3:2014, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 3: Common rules*

ISO/IEC 15459-4:2014, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 4: Individual products and product packages*

ISO/IEC 15459-5:2014, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 5: Individual returnable transport items (RTIs)*

ISO/IEC 15459-6:2014, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 6: Groupings*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

DIN and DKE maintain terminological databases for use in standardization at the following addresses:

— DIN-TERMinologieportal: available at https://www.din.de/go/din-term

— DKE-IEV: available at https://www.dke.de/DKE-IEV

3.1
active material
material which reacts chemically to produce electric energy when the battery cell discharges or to store electric energy when the battery is being charged

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(5)]

3.2
battery
device delivering electrical energy generated by direct conversion of chemical energy, having internal or external storage, and consisting of one or more non-rechargeable or rechargeable battery cells, modules or of packs of them and includes a battery that has been subject to preparation for re-use, preparation for repurposing, repurposing or remanufacturing

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(1)]

3.3
battery batch
consistently manufactured groups of batteries of a battery model, identifiable by their batch identification code

Note 1 to entry: A Battery batch is produced in a specific manufacturing plant at a specific period in time uniform in character and quantity as shown by compliance with production and quality assurance test requirements and produced during a defined validated process with constant parameters and inputs.

Note 2 to entry: Individual batteries of a battery batch share identical characteristics in manufacturing process and raw material input, e.g., sourcing and characteristics such as share of renewable energy used.

[SOURCE: Battery Passport Content Guidance, 4.1.2]

3.4
battery category
description of the scope of application of a battery in terms of its use, regardless of its design, chemical composition, and regardless of whether it is incorporated in, added to or designed for incorporation in other products

Note 1 to entry: Battery categories are derived from the definitions in EU Battery Regulation (EU) 2023/1542 and are e.g. "portable battery", "electric vehicle battery", "industrial battery", "stationary battery energy storage system", "light means of transport (LMT) battery" or "Starting, Light and Ignition (SLI) battery" (see definitions in BattReg Article 3).

Note 2 to entry: Battery categories are not explicitly defined in EU Battery Regulation (EU) 2023/1542 but derived from context therein.

3.5
battery cell
basic functional unit, consisting of an assembly of electrodes, electrolyte, container, terminals and usually separators, that is a source of electric energy obtained by direct conversion of chemical energy

[SOURCE: IEC 60050-482:2004, 482-01-01]

3.6
battery chemistry
battery composition in general terms, as indication for battery differences, defined as active materials in cathode, anode, and electrolyte

[SOURCE: Battery Passport Content Guidance, 4.1.2]

3.7
battery management system
BMS
electronic system associated with a battery which has functions to control current in case of overcharge, overcurrent, overdischarge, and overheating and which monitors and/or manages the battery's state, calculates secondary data, reports that data and/or controls its environment to influence the battery's safety, performance and/or service life

Note 1 to entry: Overdischarge cut-off is not mandatory if there is an agreement between the cell manufacturer and the customer.

Note 2 to entry: The function of the BMS can be assigned to the battery pack or to equipment that uses the battery.

Note 3 to entry: The BMS can be divided and it can be found partially in the battery pack and partially on the equipment that uses the battery.

Note 4 to entry: The BMS is sometimes also referred to as a BMU (battery management unit).

[SOURCE: DIN EN IEC 62619 (VDE 0510-39):2023-08, 3.12]

3.8
battery manufacturing waste
pre-consumer waste
materials or objects rejected during the battery manufacturing process, which cannot be re-used as an integral part in the same process and need to be recycled

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(51)]

3.9
battery model
version of all battery units which share the same technical characteristics relevant for the requirements of Regulation (EU) 2023/1542 on sustainability, safety, labelling, marking and information, and the same model identifier

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(19)]

3.10
battery module
group of cells connected together either in a series and/or parallel configuration with or without protective devices (e.g. fuse or positive temperature coefficient device (PTC)) and monitoring circuitry

[SOURCE: DIN EN IEC 62619 (VDE 0510-39):2023-08, 3.9]

3.11
battery pack
any set of battery cells or modules that are connected together or encapsulated within an outer casing, to form a complete unit which is not meant to be split up or opened by the end-user

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(2)]

3.12
battery passport
electronic record of a battery item

EXAMPLE product specific digital product passport (DPP)

[SOURCE: Regulation (EU) 2023/1542, Article 77]

3.13
battery status
current status of a battery item in its life cycle, with the options ‘original’, ‘re-used’, ‘repurposed’, ‘remanufactured’ and ‘waste’

Note 1 to entry: Source does not provide explicit definition of the battery status options. ’Re-used’, ’repurposed’ and ’remanufactured’ are ambiguous and shall be used only with further description of applied treatments and all resulting changes versus ’original’.

Note 2 to entry: There are various other, as well ambiguous terms such as ‘repaired’, ‘reworked’, ‘refurbished’, ‘restored’, ‘recovered’, ‘refreshed’, ‘repowered’, ‘rebuilt’, ‘reassembled’. They can be used additionally but not alternatively as further description.

[SOURCE: Regulation (EU) 2023/1542, Annex XIII, 4 (c)]

3.14
battery with external storage
battery that is specifically designed to have its energy stored exclusively in one or more attached external devices

Note 1 to entry: Batteries with external storage are better known as flow batteries.

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(8)]

3.15
carbon footprint
sum of greenhouse gas emissions and greenhouse gas removals in a product system, expressed as carbon dioxide equivalents and based on a Product Environmental Footprint (PEF) study using the single impact category of climate change

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(21)]

3.16
digital product passport
DPP
product passport
set of data specific to a product that includes the information specified in the applicable delegated act and is accessible via electronic means through a data carrier

[SOURCE: Regulation (EU) 2024/1781, Article 2(28)]

3.17
disassembly
process whereby an item is taken apart in such a way that it could subsequently be reassembled and made operational

Note 1 to entry: The process typically uses simple tools, such as screwdrivers, pliers and wrenches.

3.18
dismantling
process whereby a product is taken apart in such a way that some parts can be reused, although the product (and the parts not intended to be reused) can no longer be reassembled and made operational

Note 1 to entry: "Part" means any element of a product, as defined by that product's type design (see Regulation (EU) 2018/1139, Article 3 (4)).

[SOURCE: DIN EN 17615:2022-12, 3.90]

3.19
static data
data that do not change often or not on a regular basis

[SOURCE: Commission Delegated Regulation (EU) 2022/670, Article 2(5)]

3.20
dynamic data
data that change often or on a regular basis

[SOURCE: Commission Delegated Regulation (EU) 2022/670, Article 2(6)]

3.21
economic operator
manufacturer, authorised representative, importer, distributor or fulfilment service provider or any other natural or legal person who is subject to obligations in relation to the manufacture, preparation for re-use, preparation for repurposing, repurposing or remanufacturing of batteries, the making available or the placing of batteries on the market, including online, or the putting of batteries into service in accordance with Regulation (EU) 2023/1542

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(22)]

3.22
electric vehicle battery
EV battery
battery that is specifically designed to provide electric power for traction in hybrid or electric vehicles of category L as provided for in Regulation (EU) No 168/2013, that weighs more than 25 kg, or a battery that is specifically designed to provide electric power for traction in hybrid or electric vehicles of categories M, N or O as provided for in Regulation (EU) 2018/858

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(14)]

3.23
end-user
natural or legal person residing or established in the European Union, to whom a product has been made available either as a consumer outside of any trade, business, craft or profession or as a professional end-user in the course of its industrial or professional activities

[SOURCE: Regulation (EU) 2019/1020, Article 3 (21)]

3.24
importer
any natural or legal person established within the European Union who places on the [European Union's] market a battery from a third country

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(64)]

3.25
battery item
singular battery (as opposed to groups of batteries per battery model or batch), identifiable by a unique product serial number

Note 1 to entry: "Individual battery" is used synonymously in the BattReg and in the Battery Passport Content Guidance.

3.26
industrial battery
battery that is specifically designed for industrial uses, intended for industrial uses after having been subject to preparation for repurposing or repurposing, or any other battery that weighs more than 5 kg and that is neither an electric vehicle battery, an LMT battery, nor an SLI battery

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(13)]

3.27
light means of transport battery
LMT battery
battery that is sealed, weighs 25 kg or less and is specifically designed to provide electric power for the traction of wheeled vehicles that can be powered by an electric motor alone or by a combination of motor and human power, including type-approved vehicles of category L within the meaning of Regulation (EU) No 168/2013 of the European Parliament and of the Council, and that is not an electric vehicle battery

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(11)]

3.28
starting, lighting and ignition battery
SLI battery
battery that is specifically designed to supply electric power for starting, lighting, or ignition and that can also be used for auxiliary or backup purposes in vehicles, other means of transport or machinery

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(12)]

3.29
making available on the market
supply of a battery for distribution or use on the European Union's market in the course of a commercial activity, whether in return for payment or free of charge

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(17)]

3.30
manufacturer
any natural or legal person who manufactures a battery or has a battery designed or manufactured, and markets that battery under its own name or trademark or puts it into service for its own purposes

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(33)]

3.31
non-rechargeable battery
primary battery
battery that is not designed to be electrically recharged

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(6)]

3.32
rechargeable battery
secondary battery
battery that is designed to be electrically recharged

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(7)]

3.33
post-consumer waste
material generated by households or by commercial, industrial, and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose including returns of material from the distribution chain

[SOURCE: DIN EN ISO 14021:2021-10, 7.8.1.1]

3.34
preparation for repurposing
operation, by which a waste battery, or parts thereof, are prepared so that they can be used for a different purpose or application than that for which they were originally designed

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(30)]

3.35
preparation for re-use
processes, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing

[SOURCE: Directive 2008/98/EC, Article 3(16)]

3.36
producer responsibility organisation
legal entity that financially or financially and operationally organises the fulfilment of extended producer responsibility obligations on behalf of several producers

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(49)]

3.37
producer
<battery manufacturing> manufacturer, importer or distributor or other natural or legal person that, irrespective of the selling technique used, including by means of distance contracts, either:

a) is established in a Member State and manufactures batteries under its own name or trademark, or has batteries designed or manufactured and supplies them for the first time under its own name or trademark, including those incorporated in appliances, light means of transport or other vehicles, within the territory of that Member State;

b) is established in a Member State and resells within the territory of that Member State, under its own name or trademark, batteries, including those incorporated in appliances, light means of transport or other vehicles, manufactured by others, on which the name or trademark of those other manufacturers does not appear;

c) is established in a Member State and supplies for the first time in that Member State on a professional basis, batteries, including those incorporated in appliances, light means of transport or other vehicles, from another Member State or from a third country; or

d) sells batteries, including those incorporated in appliances, light means of transport or other vehicles, by means of distance contracts directly to end-users, whether or not they are private households, in a Member State, and is established in another Member State or in a third country

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(47)]

3.38
putting into service
first use, for its intended purpose, in the European Union, of a battery, without having been previously placed on the market

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(18)]

3.39
QR code
machine-readable matrix code that links to information as required by Regulation (EU) 2023/1542

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(24)]

3.40
rated capacity
total number of ampere-hours (Ah) that can be withdrawn from a fully charged battery under reference conditions

[SOURCE: Regulation (EU) 2023/1542, Annex IV(1)]

3.41
recycling
recovery operation by which waste materials are reprocessed into products, materials, or substances whether for the original or other purposes excluding energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations

Note 1 to entry: Waste materials are either from the manufacturing process (i.e., pre-consumer material) or after consumer use (i.e., post-consumer material).

[SOURCE: Directive 2008/98/EC, Article 3(17)]

3.42
remanufacturing
technical operation on a used battery that includes the disassembly and evaluation of all its battery cells and modules and the use of a certain number of battery cells and modules that are new, used or recovered from waste, or other battery components, to restore the battery capacity to at least 90 % of the original rated capacity, and where the state of health of all battery item cells does not differ more than 3 % between cells, and results in the battery being used for the same purpose or application as the one for which the battery was originally designed

Note 1 to entry: The data attributes relating to the state of health are described in Annex VII of Regulation (EU) 2023/1542 and differ depending on battery categories (see also 6.7.1).

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(32)]

3.43
repair
one or several actions carried out to return a defective product or waste to a condition where it fulfils its intended use

[SOURCE: Regulation (EU) 2024/1781, Article 2(20)]

3.44
repurposing
operation that results in a battery, that is not a waste battery, or parts thereof being used for a purpose or application other than that for which the battery was originally designed

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(31)]

3.45
re-use
operation by which products or components that are not waste are used again for the same purpose for which they were conceived

[SOURCE: Directive 2008/98/EC, Article 3(13)]

3.46
state of charge
SoC
available energy or charge in a battery expressed as a percentage of rated capacity as declared by the manufacturer, or, when the battery's state of health is no longer equal to its initial condition, of the maximum energy or charge that can be stored in the battery at the time of charging

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(27) and standardization request M/579]

3.47
state of health
SoH
measure of the general condition of a rechargeable battery and its ability to deliver the specified performance compared with its initial condition

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(28)]

3.48
stationary battery energy storage system
stationary BESS
industrial battery with internal storage that is specifically designed to store from and deliver electric energy to the grid or store for and deliver electric energy to end-users, regardless of where and by whom the battery is being used

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(15)]

3.49
treatment
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 for recycling

[SOURCE: Regulation (EU) 2023/1542, Article 3, 1(53)]

3.50
unique identifier
unique string of characters for the identification of products that also enables a link to the digital product passport

[SOURCE: Regulation (EU) 2024/1781, Article 2(30)]

3.51
waste battery
battery which the holder intends to or is required to discard or discards

[SOURCE: Directive 2008/98/EC, Article 3(1), modified – „battery“ added to term and definition]

3.52
waste management
collection, transport, recovery (including sorting), and disposal of waste, including the supervision of such operations and the after-care of disposal sites, and including actions taken as a dealer or broker

[SOURCE: Directive 2008/98/EC, Article 3(9)]

3.53
functional unit
<carbon footprint> qualitative and quantitative aspects of the functions, services, or both, provided by the battery

Note 1 to entry: The functional unit is defined as one kWh (kilowatt-hour) of the total energy provided by the battery system over the battery's service life, measured in kWh.

[SOURCE: Regulation (EU) 2023/1542, Annex II (2d, 3)]

4 Abbreviations

BattReg	Battery Regulation (EU) 2023/1542
BESS	Battery energy storage system
BMS	Battery management system
DPP	Digital product passport
ESPR	Ecodesign for Sustainable Products Regulation (EU) 2024/1781
ESO	European standardisation organisation
EV	Electric Vehicle

GBA	Global Battery Alliance
LMT	Light Means of Transport
OECD	Organisation for Economic Co-operation and Development
OJEU	Official Journal of the European Union
PLI	Person with legitimate interest
SCIP	Substances of Concern In Products
SoC	State of Charge
SOCE	State of certified energy
SoH	State of Health
URL	Uniform Resource Locator

5 Introduction to the battery passport

5.1 Legislation

The EU Battery Regulation (Regulation (EU) 2023/1542) includes a comprehensive set of information in Article 77 and Annex XIII about which data attributes must be made available in the battery passport. Figure 1 provides an overview on the many articles and annexes of the Battery Regulation detailing these requirements.

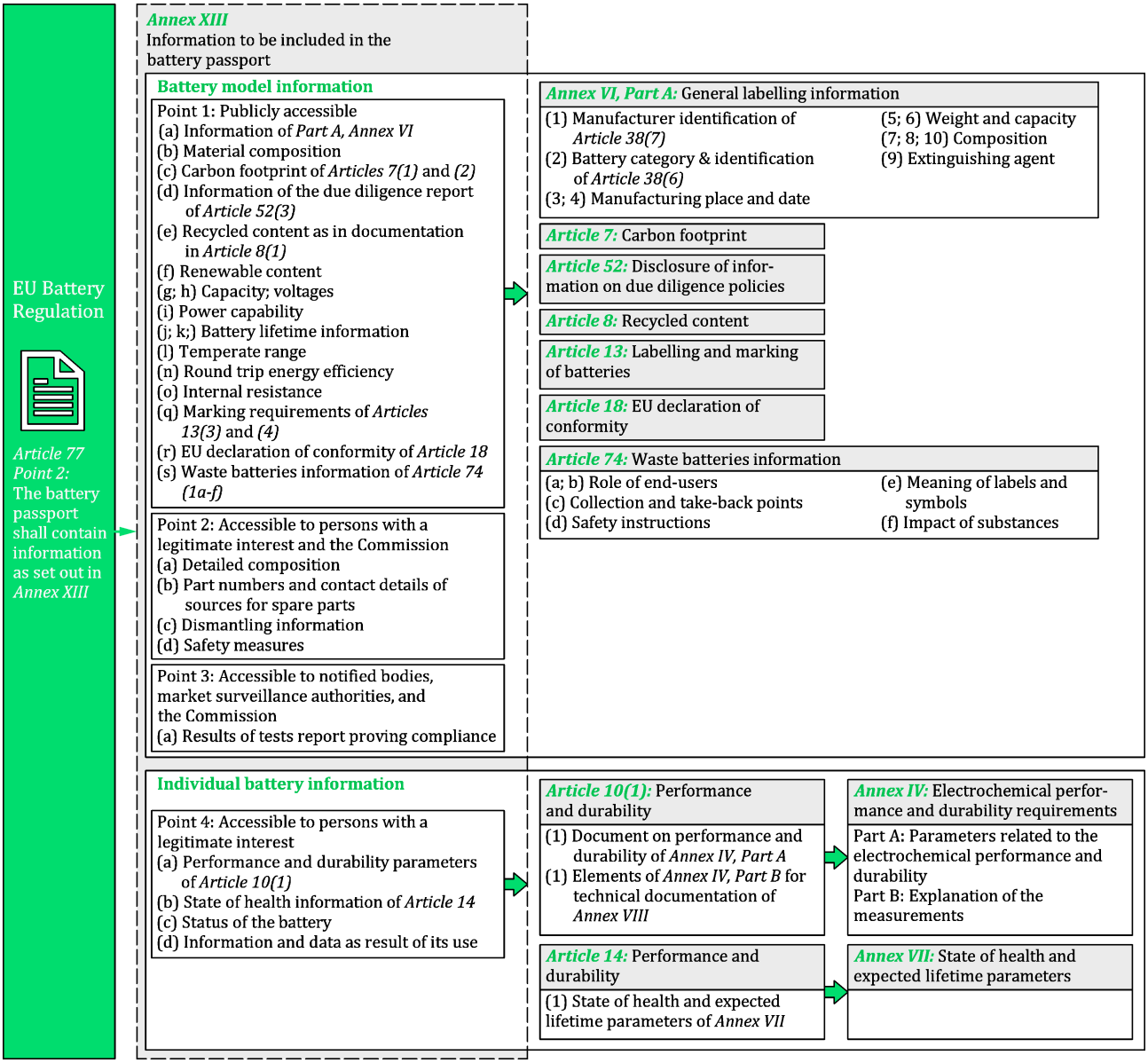
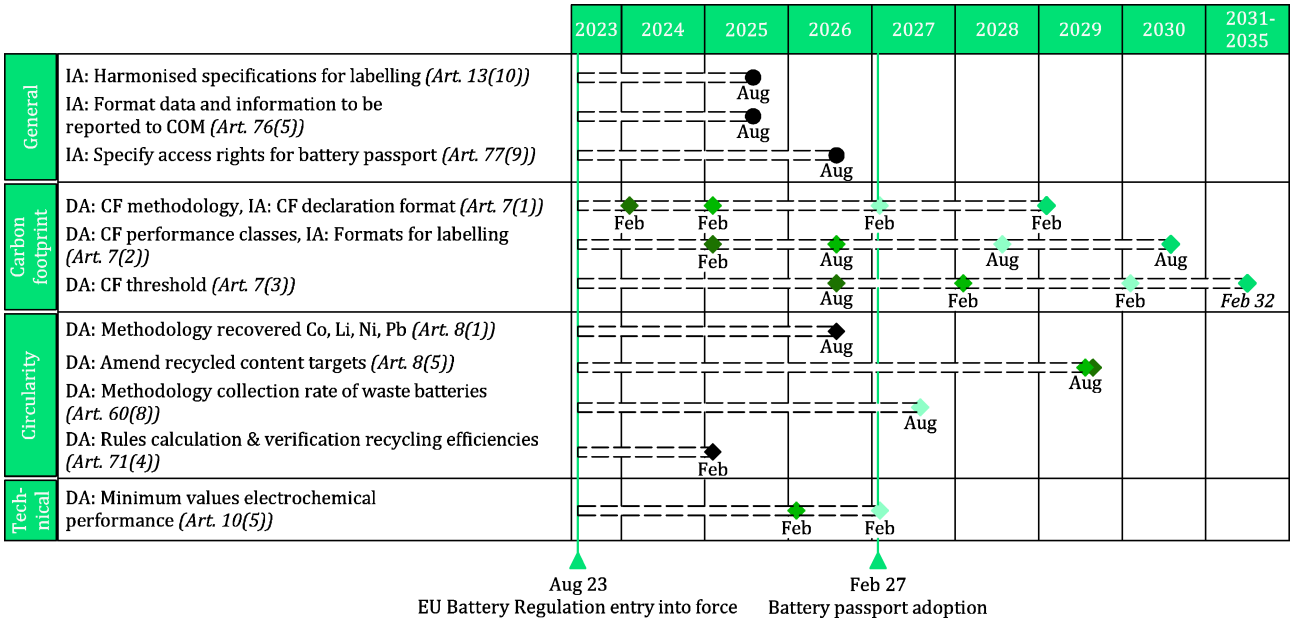


Figure 1 — Battery passport information flow in the Battery Regulation

Figure 2 shows the schedule stated by the Battery Regulation on delegated and implementing acts on the battery passport to be published.



Key

- ● IA: Implementing Act
- ◆ DA: Delegated Act
- All battery categories
- EV batteries
- Industrial batteries > 2kWh except exclusively external BEES
- Industrial batteries > 2kWh with external storage
- LMT batteries

NOTE Only acts with concrete timing displayed; acts referring to battery categories not requiring a passport excluded.

Figure 2 — Delegated & Implementing Acts scheduled by the Battery Regulation

5.2 Battery passport access

5.2.1 Access to battery passport information

a) The battery passport must be accessible through a QR code

b) The QR code must enable a link to the battery passport.

c) The QR code must be linked to a unique identifier[1] and a data carrier.

NOTE The harmonization of battery passport access is subject of a standardization request and treated by CEN/CLC/JTC 24.

d) A new battery passport must be issued when a battery was subject to remanufacturing, repurpose or one of the treatment operations preparing for re-use and preparing for repurpose and is placed on the market again.

5.2.2 Access groups

BattReg Article 77(2) distinguishes between the following access groups:

1 For information on unique identifiers see 6.1.

— the general public;

— notified bodies, market surveillance authorities and the Commission; and

— any natural or legal person with a legitimate interest in accessing and processing that information.

NOTE 1 BattReg Article 77(9) states that the Commission will adopt implementing acts, specifying which persons are to be considered persons with a legitimate interest.

NOTE 2 Standards on access rights management, information system security and business confidentiality of the Battery Passport, and the harmonization with other DPP is subject to a separate standardization request treated by CEN/CLC/JTC 24.

5.3 Labelling

It is important to ensure that besides the Battery Regulation there are existing and currently valid international obligations and requirements (e.g., IATA) related to the labeling of batteries which need to be considered and fulfilled. BattReg Article 13 states that:

a) From 18 August 2026 Batteries must bear a label containing the general information on batteries set out in BattReg Part A of Annex VI.

b) From 18 August 2025 all batteries must be marked with the symbol for separate collection of batteries.

c) From 18 February 2024 all batteries containing more than 0,002 % cadmium or more than 0,004 % lead, must be marked with the chemical symbol for the metal concerned.

d) The label must provide end-users with transparent, reliable and clear information about the battery (see Table 1).

e) A QR code must give access to a battery's product passport[2] and must be printed or engraved visibly, legibly and indelibly on the battery and should respect the guidelines of ISO/IEC 18004:2015.

f) Where this is not possible or not warranted on account of the nature and size of the battery, the labels and the QR code must be affixed to the packaging and to the documents accompanying the battery.

g) Labels and QR codes should be accessible to persons with disabilities, in accordance with Directive (EU) 2019/882 of the European Parliament and of the Council.

NOTE 1 To define the rules and specifications for the labelling and marking requirements, BattReg Article 13(10) states that the European Commission will adopt implementing acts to establish harmonised specifications by 18 August 2025.

NOTE 2 The information given is intended to enable end-users to make informed decisions when buying and discarding batteries and waste operators to appropriately treat waste batteries.

NOTE 3 For batteries outside the battery passport scope, the QR code provides access to a smaller set of information as defined in BattReg Article 13 (6b and 6c).

Table 1 contains the information to be applied to the battery label.

2 For more information on QR Code see 5.2.1.

Table 1 — Information displayed on the battery label

Information to be displayed on the label	Subclause	BattReg reference
The carbon footprint and the carbon footprint performance class[a]	6.2.4 Carbon footprint label; 6.3 Battery carbon footprint	Article 7(2) via Annex XIII (1c)
Information identifying the manufacturer: — name; — registered trade name or registered trademark; — postal address, indicating a single contact point; — web address, if available; — e-mail address, if available.	6.1.2.4 Manufacturer identifier and information	Article 13(1) via Annex VI Part A (1)
Information identifying the battery: — model identification; — batch or serial number; OR — product number; OR — element allowing identification.	6.1.2.2 Battery identifier	Article 13(1) via Annex VI Part A (2)
Battery category	6.1.3.5 Battery category	Article 13(1) via Annex VI Part A (2)
Place of manufacture geographical location	6.1.3.1 Manufacturing place	Article 13(1) via Annex VI Part A (3)
Date of manufacture month and year	6.1.3.2 Manufacturing date	Article 13(1) via Annex VI Part A (4)
Battery mass	6.1.3.6 Battery mass	Article 13(1) via Annex VI, Part A(5)
Capacity	6.7.2.2 Rated capacity	Article 13(1) via Annex VI, Part A(6)
Chemistry	6.5.2 Battery chemistry	Article 13(1) via Annex VI, Part A(7)
Hazardous substances present in the battery, other than mercury, cadmium or lead	6.5.5 Hazardous substances	Article 13(1) via Annex VI, Part A(8)
Critical raw materials present in the battery in a concentration of more than 0,1 % weight by weight	6.5.3 Critical raw materials	Article 13(1) via Annex VI, Part A(10)
Usable extinguishing agent	6.2.5 Extinguishing agent	Article 13(1) via Annex VI, Part A(9)
Symbol for separate collection	6.2.2 Separate collection symbol	Article 13(4) via Annex VI, Part B, Annex XIII (1q)
Symbol for elements	6.2.3 Symbols for cadmium and lead	Article 13(5)
QR-Code	5.2.1 Access to battery passport information	Article 13(6) Annex VI, Part C
CE-Marking[b]	6.2.7 EU declaration of conformity	Article 20(1)

NOTE 1 all information on label is accessible to the public

NOTE 2 for further information on data points see Clause 6

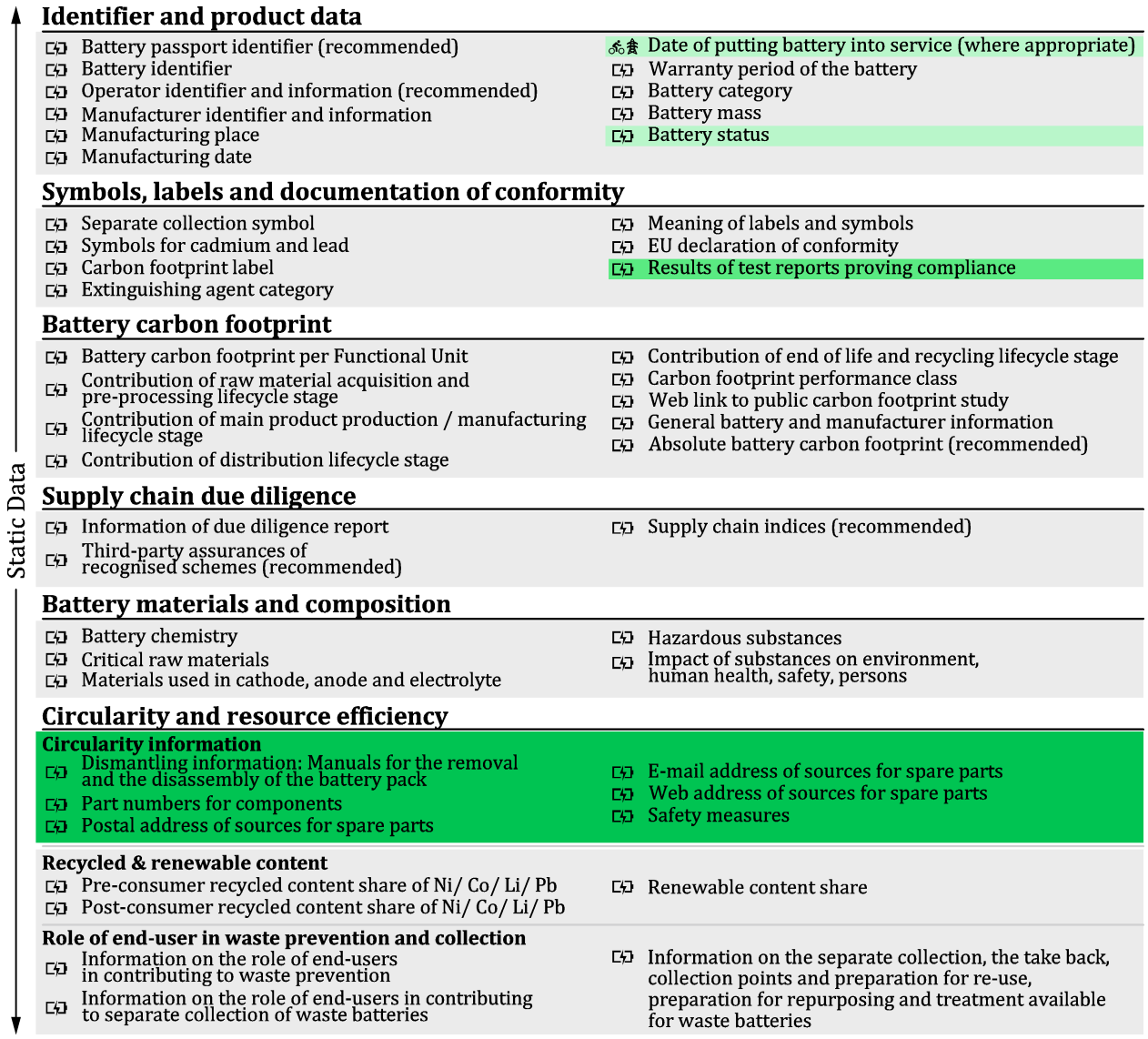
[a] Detailed timeline can be found in 6.3.7.

[b] Subject to the general principles set out in Regulation (EC) No 765/2008, Article 30.

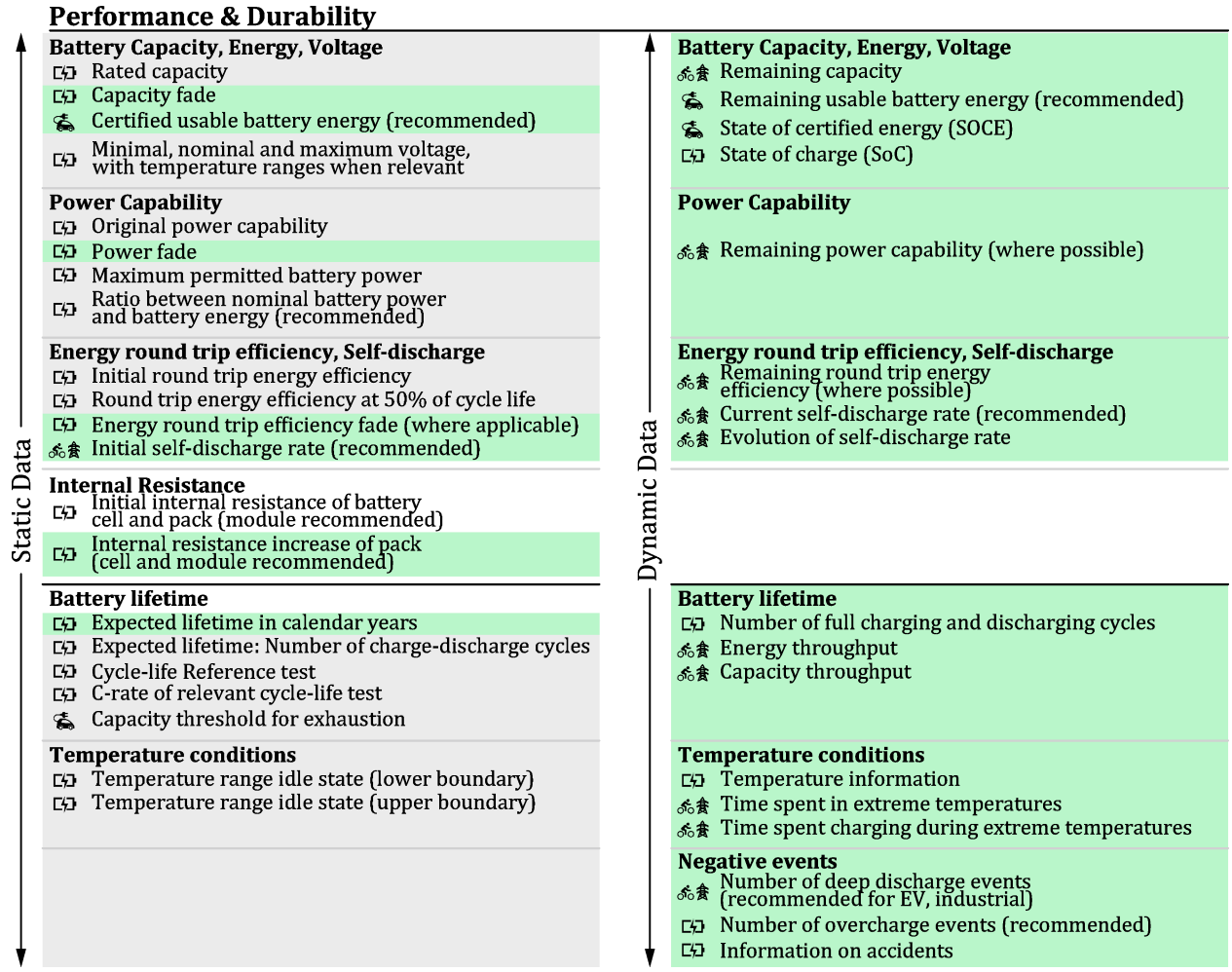
5.4 Data attributes overview

Figure 3 summarises the required and recommended respective data attributes within the structure of the following Clause 6 of this document and shows individual characteristics of the data attributes. Data attributes are static data if not stated as dynamic data in the Clause.

Annex A, Table A.1, contains a more detailed overview of all data attributes.



a) Battery passport information overview 1



b) Battery passport information overview 2

Legende

- public
- person with legitimate interest
- notified bodies, market surveillance authorities
- person with legitimate interest and Commission

- all batteries below
- EV batteries (if BMS is used)
- LMT batteries (if BMS is used)
- industrial batteries incl. stationary energy storage systems > 2 kWh
- stationary battery energy storage systems > 2 kWh

NOTE 1 BMS limitation: Data specified for all battery categories must be reported regardless of BMS use.

NOTE 2 Storage system category listed as part of entire battery passport scope. No data attribute applies solely to this battery category.

NOTE 3 Please refer to the Battery Passport Content Guidance, Annex A and the Excel document “Battery Passport Data Longlist” for more information.

Figure 3 — Battery passport information by battery categories and access groups

6 Battery passport content requirements

6.1 Identifiers and product data

6.1.1 Overview

Table 2 contains an overview of the battery passport data attributes related to identifiers and to general battery properties.

Table 2 — Battery passport data attributes related to identifiers and to general battery properties

Clause	Data attribute	BattReg reference	Data access	Data type [Unit]	Mandatory (M)/ Recommendation (R)[a]	Label information[b]	Information level[c]
6.1.2.1	Battery passport identifier	none	Public	ID[d]	R	—	Item
6.1.2.2	Battery identifier	Annex XIII (1a); Article 38(6); Article 77(3)	Public	ID	M	X	Item[e]
6.1.2.3	Operator identifier and information	ESPR Annex III(h)	Public	ID	R	—	Item
6.1.2.4	Manufacturer identifier and information	Annex VI, Part A(1); Article 38(7)	Public	ID	M	X	Model
6.1.3.1	Manufacturing place	Annex VI, Part A(3)	Public	String	M	X	Model
6.1.3.2	Manufacturing date	Annex VI, Part A(4)	Public	Date [YYYY-MM]	M	X	Item[e]
6.1.3.3	Date of putting the battery into service	Annex XIII (4)	PLI[g]	Date [YYYY-MM]	M[f]	X[f]	Item
6.1.3.4	Warranty period of the battery[h]	Annex XIII (1m)	Public	Date [YYYY-MM]	M	—	Model
6.1.3.5	Battery category	Annex VI, Part A(2)	Public	String	M	X	Model
6.1.3.6	Battery mass	Annex VI, Part A(5)	Public	Decimal [kg]	M	X	Model
6.1.3.7	Battery status	Annex XIII, 4(c)	PLI[g]	String	M	—	Item

NOTE European standards on unique identifiers are developed and drafted in the framework of the standardisation request on the DPP-system. The work is conducted in the CEN/CLC/JTC 24 “Digital Product Passport (DPP)”.

[a] “M” means the data point is mandatory according to BattReg. “R” means the data point is a recommendation.

[b] In column “Label information”, “X” means the information must also be provided on the battery label. To define and establish the rules and harmonised specifications for the labelling and marking requirements, BattReg Article 13(10) states that the European Commission must adopt implementing acts by 18 August 2025.

[c] Information level: the information relates to either battery model, battery batch or battery item.

[d] The format of the unique identifiers is part of the standardization work in CEN/CLC/JTC 24 “Digital Product Passport (DPP)” (see Note)

[e] Entry deviates from the Battery Regulation according to recommendations under 6.1.2.2.

[f] Where appropriate; only applies for stationary BESS and LMT batteries using a BMS.

[g] PLI: Persons with a legitimate interest.

[h] Legal warranty period or, if applicable, manufacturer’s guarantee period, starting from purchasing date.

6.1.2 Identifier

6.1.2.1 Battery passport identifier

The battery passport identifier is the unique identifier of a battery passport. The BattReg specifies no requirements regarding a battery passport identifier.

a) The battery passport identifier should be added as data attribute as there might be multiple battery passports attributed to one physical battery.

b) The battery passport identifier should relate to the battery item.

c) The battery passport identifier should be accessible to the public.

6.1.2.2 Battery identifier

a) A battery passport must include information identifying the battery. The battery passport must be accessible through the QR code which links to a persistent unique battery identifier. The battery identifier is a unique string of characters for the identification of batteries that also enables a link to the battery passport.

b) The battery identifier must also be provided on the battery label (see 5.3). Where the size or nature of the battery does not allow it, the required information must be provided on the packaging or in a document accompanying the battery.

c) The battery identifier must comply with ISO/IEC 15459-1:2014, ISO/IEC 15459-2:2015, ISO/IEC 15459-3:2014, ISO/IEC 15459-4:2014, ISO/IEC 15459-5:2014, ISO/IEC 15459-6:2014, or their equivalent[3].

d) The economic operator placing the battery on the market must attribute the battery identifier to it.

e) The battery identifier shall relate to the battery item[4].

f) The battery identifier must be accessible to the public.

g) The battery identifier should be serialised, i.e., identifying each battery via a serial number.

6.1.2.3 Operator identifier and information

The operator identifier is introduced in the ESPR (ESPR, Annex III(h)), but not mandatory for batteries.

a) A battery passport should include an operator identifier. The operator identifier is a unique string of characters for the identification of actors involved in the value chain of products (see ESPR, Article 2(31)). It corresponds to the economic operator responsible for creating or updating the battery passport.

b) Where a unique operator identifier is not yet available, “the economic operator that creates or updates the digital product passport shall request a unique operator identifier on behalf of the relevant actor.” (see ESPR, Article 12(2)).

NOTE In some cases, the manufacturer of the battery and the responsible economic operator that places the battery on the market are identical.

c) The operator identifier should relate to the battery item.

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3 For further information, see also DIN EN IEC 61406-1 (VDE 0810-406-1):2023-12.

4 The BattReg (Annex XIII (1a), Annex VI, Part A (2)) states that the battery identifier must relate to the battery model. Therefore, this requirement is an additional requirement to fulfill this DIN DKE SPEC.

d) The operator identifier should be accessible to the public.

e) The unique operator identifier should comply with ISO/IEC 15459-1:2014, ISO/IEC 15459-2:2015, ISO/IEC 15459-3:2014, ISO/IEC 15459-4:2014, ISO/IEC 15459-5:2014, ISO/IEC 15459-6:2014, or their equivalent until referenced harmonised standards are listed in the OJEU.

f) The unique operator identifier should comply with the Global Trade Identification Number as provided for in standard ISO/IEC 15459-6 or equivalent European or international standards until referenced harmonised standards are listed in the OJEU.

g) The operator information should include:

— name;

— registered trade name or registered trademark;

— postal address, indicating a single contact point;

— web address, if available; and

— e-mail address, if available.

6.1.2.4 Manufacturer identifier and information

a) A battery passport must include information identifying the manufacturer.

NOTE The manufacturer of the battery can differ from the responsible economic operator for the battery passport (or an authorised third party) who may change over the course of a battery's lifecycle.

b) The manufacturer information must also be provided on the battery label. Where it is not possible to indicate the required information on the battery, it must be provided on the packaging or in a document accompanying the battery.

c) The manufacturer information must include:

— name;

— registered trade name or registered trademark;

— postal address, indicating a single contact point;

— web address, if available; and

— e-mail address, if available.

d) The contact details must be indicated in a language or languages which can be easily understood by end-users and market surveillance authorities.

e) The manufacturer identifier must relate to the battery model.

f) The manufacturer identifier must be accessible to the public.

g) The unique manufacturer identifier must comply with ISO/IEC 15459-1:2014, ISO/IEC 15459-2:2015, ISO/IEC 15459-3:2014, ISO/IEC 15459-4:2014, ISO/IEC 15459-5:2014, ISO/IEC 15459-6:2014, or equivalent European or international standards until referenced harmonised standards are listed in the OJEU.

h) The unique manufacturer identifier must comply with the Global Trade Identification Number as provided for in standard ISO/IEC 15459-6 or equivalent European or international standards until referenced harmonised standards are listed in the OJEU.

6.1.3 Product data

6.1.3.1 Manufacturing place

a) A battery passport must include the manufacturing place (geographical location of a battery manufacturing plant).

b) The manufacturing place must also be provided on the battery label (see 5.3).

c) The manufacturing place must relate to the battery model.

d) The manufacturing place must be accessible to the public.

e) The manufacturing place should be uniquely identifiable. A unique facility identifier can be used for this purpose.

f) The address of the manufacturing place (country, city, street, or even building if several facilities operate under one address) should be provided in text form.

6.1.3.2 Manufacturing date

a) A battery passport must include the date of manufacture (month and year).

b) The manufacturing date must also be provided on the battery label (see 5.3).

c) The manufacturing date must consist of the month and year of the date of manufacture.

d) The manufacturing date must relate to the battery model.

e) The manufacturing date must be accessible to the public.

f) The manufacturing date should not only relate to the battery model, but to the battery item.

g) The date code should comply with DIN ISO 8601-1:2020-12 and ISO 8601-2:2019.

EXAMPLE YYYY-MM or YYYYMM

6.1.3.3 Date of putting the battery into service

a) Where appropriate, the battery passport must include information on the date of putting the battery into service for stationary BESS and LMT batteries using a BMS.

NOTE Wording “where appropriate” is not elaborated but can apply after the battery is being put into service.

b) The information on the date of putting the battery into service must relate to the battery item.

c) The information on the date of putting the battery into service must be accessible to persons with a legitimate interest.

d) The date code should comply with DIN ISO 8601-1:2020-12 and ISO 8601-2:2019.

EXAMPLE YYYY-MM or YYYYMM

6.1.3.4 Warranty period of the battery

a) The battery passport shall include information about the period for which the commercial warranty applies.

NOTE Commercial warranty for calendar life is not clearly defined. Since batteries are consumables, calendric versus cyclic ageing cannot be separated, except if the battery is not used.

b) The information on the warranty period of the battery must relate to the battery model.

c) The information on the warranty period of the battery must be accessible to the public.

d) The unit should be years and months.

6.1.3.5 Battery category

a) A battery passport must include the battery category.

b) The battery category must be provided on the battery label (see 5.3).

c) The battery must be categorised by its intended use in:

— LMT battery;

— electric vehicle battery; or

— industrial battery (stationary battery energy storage system/other industrial batteries).

NOTE When a new battery passport is issued, the battery category might change, e.g., when an EV battery is repurposed for use in a stationary battery energy storage system.

d) The information on the battery category must relate to the battery model.

e) The information on the battery category must be accessible to the public.

6.1.3.6 Battery mass

a) A battery passport must include the battery mass[5].

b) The battery mass must also be provided on the battery label (see 5.3).

c) The information on the battery mass must relate to the battery model.

d) The information on the battery mass must be accessible to the public.

e) The battery mass should be specified in kg as defined per technical documentation referred to in BattReg Annex VIII.

f) The mass of the modules and cells should also be specified.

NOTE The indication of the mass on module and cell level will allow optimisation of dismantling, disassembly, and recycling processes and will be important for recyclers to calculate recycling efficiencies.

5 The Battery Regulation requires the “battery weight”, the physically correct quantity and therefore used in this document is “mass” (DIN EN ISO 80000-4:2020-01, 4-1 vs. 4-9.2).

6.1.3.7 Battery status

a) A battery passport must include information on the status of the battery.

b) The status of the battery must be defined as ‘original’, ‘repurposed’, ‘re-used’, ‘remanufactured’ or ‘waste’.

c) The information on the battery status must relate to the battery item.

d) The information on the battery status must be accessible only to persons with a legitimate interest.

e) A new battery passport must be issued when a battery was subject to remanufacturing, repurpose or one of the treatment operations preparing for re-use and preparing for repurpose and is placed on the market again.

f) Additionally to the battery status, the battery’s repair history shall be included.[6]

g) The repair of a battery shall be made transparent and be recorded as “repaired” under the battery status “re-used”.[6]

NOTE 1 A battery status “repaired” is not considered in the Battery Regulation but of great value, particularly for LMT batteries as the Battery Regulation requires for LMT batteries and their cells included in the battery pack to be readily removable and replaceable by an independent professional (see BattReg Article 11(5)).

NOTE 2 There are various other battery handling options and describing terms, e.g., ‘refurbished’. They can be used additionally but not alternatively to the required battery status as further description and can be clearly defined.

NOTE 3 Some battery treatments (many related to the so-called ‘R-strategies’) can lead to a loss of type-test based certificates. This includes the loss of validity of the test report summary required for dangerous goods transportation of lithium batteries and lithium ion batteries which require testing under the UN Manual of Tests and Criteria, chapter 38.3. Rules can be established for the removal of the CE marking if treatments result in the battery no longer meeting conformity standards.

6.2 Symbols, labels and documentation of conformity

6.2.1 Overview

Table 3 contains an overview of the battery passport data attributes related to the symbols and labels of the battery.

6 This is not explicitly required by the Battery Regulation, but is necessary to fulfill this DIN DKE SPEC.

Table 3 — Overview of battery passport data attributes for symbols, labels and documentation of conformity

Clause	Data attribute	BattReg reference	Data access	Data type [Unit]	Mandatory (M)/ Recommendation (R)	Label information	Information level
6.2.2	Separate collection symbol	Article 13(4) via Annex XIII (1q)	Public	Graphic	M	X	Model
6.2.3	Symbols for cadmium and lead	Article 74(1e) via Annex XIII (1s)	Public	Graphic	M	X	Model
6.2.4	Carbon footprint label[a]	Article 7(2) via Annex XIII (1c)	Public	Graphic	M	X	Model
6.2.5	Extinguishing agent	Annex VI, Part A(9)	Public	String	M	X	Model
6.2.6	Meaning of labels and symbols	Article 74(1e) via Annex XIII (1s)	Public	String	M	X	Model
6.2.7	EU declaration of conformity	Article 18 via Annex XIII (1r)	Public	PDF	M	X[b]	Model
6.2.8	Results of test reports proving compliance	Annex XIII (3)	NB, MSA, EC[c]	PDF	M	—	Model

NOTE To define the rules and specifications for the labelling and marking requirements, BattReg Article 13(10) states that the European Commission must adopt implementing acts to establish harmonised specifications by 18 August 2025.

[a] Detailed timeline can be found in 6.3.7.

[b] Proof of conformity shown through CE mark on label.

[c] NB: Notified bodies, MSA: market surveillance authorities, EC: the European Commission

6.2.2 Separate collection symbol

a) The battery passport must include the symbol for separate collection shown in Figure 4.

b) All batteries must be marked on the label with the symbol for separate collection from 18 August 2025.

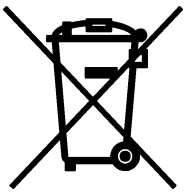

Figure 4 — Separate collection symbol (see BattReg Annex VI Part B)

c) The symbol must relate to the battery model.

d) The symbol must be accessible to the public.

e) The separate collection symbol must cover at least 3 % of the area of the largest side of the battery with a maximum size of (5 × 5) cm^2.

f) For Cylindrical battery cells: The symbol must cover at least 1,5 % of the surface area of the battery and with a maximum size of (5 × 5) cm^2.

g) Where the symbol would be smaller than (0,47 × 0,47) cm^2, the battery does not need to be marked with it. Instead, the symbol measuring at least (1 × 1) cm^2 must be printed on the packaging.

h) The symbol should be translated into text to ensure machine readability.

6.2.3 Symbols for cadmium and lead

a) The battery passport must include information regarding the prevention and management of waste batteries including the meaning of the labels and symbols on batteries or printed on their packaging or in the documents accompanying batteries.

b) Batteries containing more than 0,002 % cadmium or more than 0,004 % lead, must be marked with the chemical symbol for the metal concerned: Cd or Pb.

c) The symbols for cadmium and lead must also be provided on the battery label (see 5.3).

d) The information must relate to the battery model.

e) The information must be accessible to the public.

f) The relevant chemical symbol indicating the heavy metal content must be printed beneath the separate collection symbol and must cover an area of at least one-quarter the size of that symbol.

g) The symbol should be translated into text to ensure machine readability of the battery passport.

6.2.4 Carbon footprint label

a) EV batteries, rechargeable industrial batteries > 2 kWh and LMT batteries must bear a conspicuous, clearly legible and indelible label indicating the carbon footprint and declaring the carbon footprint performance class to which the relevant battery model per manufacturing plant corresponds.

b) The carbon footprint label should be displayed directly in the battery passport in addition to the data in the documentation.

c) The label should be translated into text/numbers to ensure machine readability of the battery passport.

For the content and calculation of the carbon footprint, see 6.3.2 and 6.3.4.

NOTE BattReg Article 7(2) states that the Commission must adopt an implementing act establishing the formats for the labelling referred to in the first subparagraph and the format for the declaration on the carbon footprint performance class referred to in that subparagraph. This must be done by 18 February 2025 for EV batteries, 18 August 2026 for rechargeable industrial batteries except those with exclusively external storage, 18 August 2028 for LMT batteries and 18 August 2030 for rechargeable industrial batteries with external storage. That implementing act must be adopted in accordance with the examination procedure referred to in BattReg Article 90(3).

6.2.5 Extinguishing agent

a) A battery passport must include the usable extinguishing agent.

b) The usable extinguishing agent must also be provided on the battery label (see 5.3).

EXAMPLE Water is the usable extinguishing agent for some battery chemistries.

c) The information must relate to the battery model.

d) The information must be accessible to the public.

e) Where applicable, the extinguishing agent category should be indicated.

f) The information on the usable extinguishing agent should be related to their possible area of application as regulated in DIN EN 2.

6.2.6 Meaning of labels and symbols

a) The battery passport must include information regarding the prevention and management of waste batteries including the meaning of the labels and symbols on batteries or printed on their packaging or in the documents accompanying batteries.

b) The meaning of labels and symbols shall be provided on the battery label (see 5.3) or shall be included in the documentation accompanying the battery.

c) The information must relate to the battery model.

d) The information must be accessible to the public.

e) The information must be communicated in (a) language(s) easily understood by end-users .

f) The meaning of all symbols and labels on the battery or/and in the battery passport should be explained.

g) The explanatory texts should be agreed on across industry to ease the implementation and ensure comprehensibility for the public.

6.2.7 EU declaration of conformity

a) A battery passport must include the EU declaration of conformity.

b) The information must relate to the battery model.

c) The information must be accessible to the public.

d) The document that declares compliance with the EU requirements and assumes responsibility should be uploaded into the battery passport.

e) The ID of the EU declaration of conformity should also be displayed in addition to the document.

f) The CE marking pictogram should be included in the battery passport.

The regulation specifies the following requirements regarding the EU declaration of conformity (see BattReg Annex XIII (1r) and BattReg Article 18 (2)):

— The EU declaration of conformity has the model structure set out in Annex IX.

— The EU declaration of conformity must contain the elements specified in the relevant modules set out in Annex VIII.

— The EU declaration of conformity must be kept up to date.

— It is translated into the language or languages required by the Member State in which the battery is placed or made available on the market or put into service.

— It must be drawn up in electronic format and, where requested, it must be provided in paper format.

6.2.8 Results of test reports proving compliance

a) A battery passport must include the test report results that can prove the compliance with the requirements stated in the battery regulation.

b) The results must relate to the battery model.

c) The results must be accessible only to notified bodies, market surveillance authorities and the Commission: results of test reports proving compliance with the requirements laid down in the BattReg or any delegated or implementing act adopted pursuant to the BattReg.

d) A placeholder for the reference to the test reports should be included as the format or specific contents of the test reports are not further specified yet.

6.3 Battery carbon footprint

6.3.1 Overview

Table 4 provides an overview of the battery passport data attributes related to the battery carbon footprint.

Table 4 — Battery passport data attributes related to the battery carbon footprint

Clause	Data attribute	BattReg reference	Data access	Data type [Unit]	Mandatory (M)/ Recommendation (R)	Label information	Information level
6.3.2	Battery carbon footprint per Functional Unit	Annex XIII, Article 7(1)	Public	[kgCO2e/kWh]	M	X	Model
6.3.3	Contribution of raw material acquisition and pre-processing lifecycle stage	Annex XIII, Article 7(1)	Public	[kgCO2e/kWh]	M	—	Model
6.3.4	Contribution of main product production/manufacturing lifecycle stage	Annex XIII, Article 7(1)	Public	[kgCO2e/kWh]	M	—	Model
6.3.5	Contribution of distribution lifecycle stage	Annex XIII, Article 7(1)	Public	[kgCO2e/kWh]	M	—	Model
6.3.6	Contribution of end of life and recycling lifecycle stage	Annex XIII, Article 7(1)	Public	[kgCO2e/kWh]	M	—	Model
6.3.7	Carbon footprint performance class	Annex XIII, Article 7(2)	Public	String	M	X	Model
6.3.8	Web link to public carbon footprint study	Annex XIII, Article 7(1)	Public	Link to PDF	M	—	Model
6.3.9	General battery and manufacturer information	Annex XIII, Article 7(1)	Public	See 6.1 and 6.2	M	—	Model
6.3.10	Absolute battery carbon footprint	none	Public	[tCO2e]	R	—	Model

The subsequent requirements do not apply to batteries subjected to preparation for re-use, repurposing, or remanufacturing if already placed on the market or put into service before such operations.

NOTE 1 BattReg does not state whether these requirements apply to second life batteries imported from non-EU markets.

NOTE 2 Economic operators and suppliers are advised to follow the delegated and implementing act processes in the EU Commission and consider consulting sector-specific carbon footprint methodologies, such as the EU PEFCR for batteries or the Global Battery Alliance GHG Rulebook as well as other relevant international standards in their most recent versions. As the delegated and implementing acts will specify the carbon footprint calculation and reporting, any consulted methodology must be in line with the respective EU requirements.

6.3.2 Battery carbon footprint per Functional Unit

a) The battery passport must contain carbon footprint per functional unit of the battery as declared in the battery carbon footprint declaration in accordance with the entry into force of the implementing acts on the format of declaration (see below and Figure 2).

   NOTE 1 Until it becomes accessible via the QR code (see BattReg Article 13(6)) or via the battery passport (see BattReg Article 77), the carbon footprint declaration accompanies the battery and the carbon footprint is indicated on a conspicuous, clearly legible and indelible label (see 6.2 and 6.2.4).

   The carbon footprint declaration is subject to the conformity assessment of batteries with the respective requirements set out in BattReg Article 17. The responsible economic operator must provide the EU declaration of conformity in line with BattReg Article 18.

b) The battery carbon footprint must be included as declared in terms of kg of carbon dioxide equivalent per one kWh of the total energy provided by the battery over its expected service life.

   NOTE 2 For each battery category, the delegated acts might specify a different functional unit for the respective carbon footprint declaration.

c) The battery carbon footprint must relate to the battery model per manufacturing plant.

d) The information must be accessible to the public.

e) The carbon footprint of the battery shall also be differentiated as contribution of the lifecycle stages to the battery carbon footprint (see 6.3.3 to 6.3.6).

f) Economic operators must perform a carbon footprint declaration for EV batteries, rechargeable industrial batteries > 2 kWh and light means of transport (LMT) batteries for each battery model per manufacturing plant.

NOTE 3 BattReg Article 7(1) states that the carbon footprint declaration will apply from:

— **EV batteries**: 18 February 2025 or 12 months after the date of entry into force either of the delegated act or of the implementing act for EV batteries;

— **Rechargeable industrial batteries (without external storage)**: 18 February 2026 or 18 months after the date of entry into force either of the delegated act or of the implementing act, whichever is the latest, for rechargeable industrial batteries except those with exclusively external storage;

— **LMT batteries**: 18 August 2028 or 18 months after the date of entry into force either of the delegated act or of the implementing act, whichever is the latest, for LMT batteries;

— **Rechargeable industrial batteries (with external storage)**: 18 August 2030 or 18 months after the date of entry into force either of the delegated act or of the implementing act, whichever is the latest, for rechargeable industrial batteries with external storage.

NOTE 4 Delegated acts will establish the methodology for the calculation and verification of the carbon footprint of the battery referred to in BattReg Article 7(1d) and in accordance with the essential elements set out in BattReg Annex II. The implementing act will establish the format for the carbon footprint declaration. Therefore, this document does not include considerations on the carbon footprint methodologies but refers to the below delegated and implementing acts with deadlines corresponding to the battery category.

NOTE 5 BattReg Article 7(1) states that the EU Commission will adopt these delegated acts (calculation and verification) and implementing acts (format of declaration) by:

— 18 February 2024 for EV batteries (delayed, draft delegated act as of July 2024 and draft implementing act as of July 2024);

— 18 February 2025 for rechargeable industrial batteries, except those with external storage;

— 18 February 2027 for LMT batteries; and

— 18 February 2029 for industrial batteries with external storage.

6.3.3 Contribution of raw material acquisition and pre-processing lifecycle stage

a) A battery passport must include the contribution of the lifecycle stage “Raw material acquisition and pre-processing” in the battery carbon footprint.

The lifecycle stage is described in the essential elements of the BattReg Annex II.

The system boundaries and reporting requirements are specified in the delegated acts for the carbon footprint methodology outlined in 6.3.2.

The same mandatory requirements as above (6.3.2) are required for this data point.

6.3.4 Contribution of main product production/manufacturing lifecycle stage

a) A battery passport must include the contribution of the lifecycle stage “Main product production” in the battery carbon footprint.

The lifecycle stage is described in the essential elements of the BattReg Annex II.

The system boundaries and reporting requirements are specified in the delegated acts for the carbon footprint methodology outlined in 6.3.2.

The same mandatory requirements as above (6.3.2) are required for this data point.

6.3.5 Contribution of distribution lifecycle stage

a) A battery passport must include the contribution of the lifecycle stage “Distribution” in the battery carbon footprint.

The lifecycle stage is described in the essential elements of the BattReg Annex II.

The system boundaries and reporting requirements are specified in the delegated acts for the carbon footprint methodology outlined in 6.3.2.

The same mandatory requirements as above (6.3.2) are required for this data point.

6.3.6 Contribution of end of life and recycling lifecycle stage

a) A battery passport must include the contribution of the lifecycle stage “End of life and Recycling” in the battery carbon footprint.

The lifecycle stage is described in the essential elements of the BattReg Annex II.

The system boundaries and reporting requirements are specified in the delegated acts for the carbon footprint methodology outlined in 6.3.2.

The same mandatory requirements as above (6.3.2) are required for this data point.

6.3.7 Carbon footprint performance class

a) The battery passport must include the carbon footprint performance class in accordance with the entry into force of the delegated and implementing acts on the carbon footprint performance classes per Article 7 of the Battery Regulation (see Figure 2).

b) The carbon footprint performance class shall be provided on a conspicuous, clearly legible and indelible label (see 6.2.4 on labels).

c) EV batteries, rechargeable industrial batteries > 2 kWh and LMT batteries must declare the carbon footprint performance class via the corresponding label.

d) The information must relate to the battery model per manufacturing plant.

e) The information must be accessible to the public.

NOTE 1 BattReg Article 7(2) states that the carbon footprint performance class will apply from:

— **EV batteries:** 18 August 2026 or 18 months after the date of entry into force either of the delegated act or of the implementing act, whichever is the latest, for EV batteries;

— **Rechargeable industrial batteries (without external storage):** 18 August 2027 or 18 months after the date of entry into force either of the delegated act or of the implementing act, whichever is the latest, for rechargeable industrial batteries except those with exclusively external storage;

— **LMT batteries**: 18 February 2030 or 18 months after the date of entry into force either of the delegated act or of the implementing act, whichever is the latest, for LMT batteries;

— **Rechargeable industrial batteries (with external storage):** 18 February 2032 or 18 months after the date of entry into force either of the delegated act or of the implementing act, whichever is the latest, for rechargeable industrial batteries with external storage.

NOTE 2 BattReg Article 7(2) states that the performance classes will be adopted by delegated acts and the format of the labelling by implementing acts:

— 18 February 2025 for EV batteries;

— 18 August 2026 for rechargeable industrial batteries except those with exclusively external storage;

— 18 August 2028 for LMT batteries; and

— 18 August 2030 for rechargeable industrial batteries with external storage.

6.3.8 Web link to public carbon footprint study

a) The battery passport must include a web link to the carbon footprint study accompanying the battery carbon footprint declaration. The information and reporting requirements are specified in the corresponding delegated acts as outlined in 6.3.2.

b) The information must relate to the battery model per manufacturing plant.

c) The information must be accessible to the public.

6.3.9 General battery and manufacturer information

BattReg Article 7(1) states that the battery passport must contain general battery and manufacturer information in relation to the battery carbon footprint. These will be specified in implementing acts in the context of the carbon footprint declaration as described in 6.3.2. Correspondingly, the data attributes should link to the ones specified in this document in 6.1 and 6.2:

— 6.1.2.2 and 6.1.3.5 Information about the battery model;

— 6.1.2.4 Administrative information about the manufacturer;

— 6.1.3.1 Information about the geographic location of the battery manufacturing plant;

— 6.2.7 Identification number of the EU declaration of conformity of the battery.

6.3.10 Absolute battery carbon footprint

As a non-mandatory data attribute, the battery passport should include the battery carbon footprint in absolute terms.

a) The absolute battery carbon footprint should be stated in tons of carbon dioxide equivalents.

b) The information should relate to the battery model per manufacturing plant.

c) The information should be accessible to the public.

d) The absolute battery carbon footprint should be calculated as kilograms of carbon dioxide equivalent, without reference to the functional unit as prescribed by the battery regulation.

NOTE The absolute battery carbon footprint as determined for the carbon footprint declaration is not divided by the functional unit. This enables stakeholders to assess and compare the carbon footprint in terms of the absolute carbon emissions impact. The absolute carbon footprint per battery facilitates an integration of declared battery carbon footprints into corporate reportings and usage for benchmarking purposes. As the battery regulation's functional unit is battery-specific (i.e., not per unit), an integration of the declared battery carbon footprint per functional unit into corporate reportings and comparability outside the EU would not be possible.

6.4 Supply chain due diligence

6.4.1 Overview

Battery materials and components are often fraught with unethical working conditions and negative environmental effects. Due to a lack of supply chain transparency, downstream suppliers might not appropriately identify and address such risks. At the same time, regulatory requirements preventing social and environmental issues are falling short. Hence, the EU Battery Regulation demands "battery due diligence" that refers to obligations aiming at "identifying, preventing and addressing actual and potential social and environmental risks linked to the sourcing, processing and trading of the raw materials and secondary raw materials required for battery manufacturing" (see BattReg Article 3(42)). These obligations are following a risk-based approach to identify, prevent, mitigate, and if needed address adverse impacts. Annex B provides further information regarding the obligations for economic operators on due diligence policies.

NOTE 1 The regulatory requirements from the EU Battery Regulation are partly overlapping with the German Supply Chain Act (GerSCA), as well as the EU Corporate Sustainability Due Diligence Directive (EU CSDDD) (as relevant in the German and EU context). One harmonised due diligence report might cover all required elements of the GerSCA, EU CSDDD and the Battery Regulation.

a) The report on the fulfilment of due diligence obligations in the previous financial year must be prepared annually.

b) The report must be easily comprehensible for end-users.

c) The due diligence report shall be created and uploaded based on the five-step framework of the OECD Due Diligence Guidance for Minerals.

NOTE 2 For more information on the OECD five-step framework: Due diligence explained – European Commission (www.europa.eu).

The scope of the battery due diligence obligations refers to the entire value chain including "sourcing, processing and trading of the raw materials and secondary raw materials required for battery manufacturing" (see BattReg Article 3(42)).

d) The scope shall include those materials listed in BattReg Annex X (1), being: cobalt, natural graphite, lithium, nickel, and chemical compounds based on these raw materials being necessary for manufacturing battery active materials.

NOTE 3 Recycling processes are covered as allocated via the recycled content.

Table 5 shows Battery Passport Data Points on Due Diligence Obligations.

For detailed obligations for economic operators on due diligence policies see Annex B.

The BattReg introduces two cases, for which the due diligence obligations are not effective:

— If batteries, which have been subject to re-use, preparation for repurposing, repurposing, or remanufacturing, were already placed on the market or put into service before undergoing such operations (see BattReg Article 47).

— For economic operators (or their parent group) with a net turnover of less than € 40 million in the second last financial year (see BattReg Article 47).

In case of non-compliance with the due-diligence obligations, BattReg Article 83 states that Member States require the economic operator to end the non-compliance or otherwise, the Member States take measures to restrict or prohibit the economic operator from making the batteries available on the market; or even recalling or withdrawing the batteries from the market.

Table 5 — Mandatory and suggested supply chain due diligence information to be made available via the battery passport

Clause	Data attribute	BattReg reference	Data access	Data type [Unit]	Mandatory (M)/ Recommendation (R)	Label information	Information level
6.4.2	Information of due diligence report in the Battery Passport	Annex XIII (1d); Article 52(3)	Public	PDF	M	—	Model
6.4.3	Third-party assurances (e.g., certifications) of recognised schemes	Article 53	Public	—	R	—	Model
6.4.4	Supply chain indices	None	Public	—	R	—	Model

6.4.2 Information of due diligence report in the Battery Passport

The due diligence report is a report on the supply chain due diligence policy, risk management plan, and summary of third-party verification ("due diligence report").

a) The battery passport must include the "information on responsible sourcing as indicated in the report on its due diligence policy referred to in BattReg Article 52(3)".

b) The due diligence report must be accessible free of charge to the public via the battery passport and also on the internet.

c) The report and hence also the information in the battery passport must provide data and information on four aspects:

   — **Supply chain due diligence policy:** steps taken by the economic operator to comply with the requirements of Article 49.

   — **Risk management plan:** steps taken by the economic operator to comply with the requirements of Article 50, including findings of significant adverse impacts.

   — **Summary report of the third-party verification** carried out (Article 51).

   — An elaboration on **access to information, public participation** in decision-making and access to justice.

d) Only the current annual due diligence report valid for the specific battery at the time of placing it on the market should be linked.

e) The information in the battery passport must be "machine-readable, structured, and searchable".

f) The due diligence reports should be made available as PDFs.

g) For the battery passport, a link to the PDF uploaded to the company website should be made available.

h) Key information of the due diligence report can be reported as individual datapoints in the battery passport if clearly offering added value for certain stakeholders (e.g., end consumer or authorities).

6.4.3 Third-party assurances of recognised schemes

a) As a non-mandatory data attribute the battery passport should contain information on third-party supply chain assurances such as certifications, of recognised supply chain schemes. Based on the provided guidance, explore which and how to best make third-party assurances available via the battery passport.

6.4.4 Supply chain indices

a) As a non-mandatory data attribute the battery passport should contain supply chain indices to allow easy assessment for consumers on level of responsible sourcing. ESGE+ indices under development by the GBA (Global Battery Alliance), scoring and benchmarking sustainability performance. Once developed, explore how to best make the indices available via the battery passport.

NOTE For more information see GBA Rulebook (https://www.globalbattery.org/press-releases/launch-of-child-labour-and-human-rights-rulebooks/).

6.5 Battery materials and composition

6.5.1 Overview

Table 6 contains an overview of the battery passport data attributes related to the battery materials and composition.

Table 6 — Battery passport data attributes related to battery materials and composition

Clause	Data attribute	BattReg reference	Data access	Data type [Unit]	Mandatory (M)/ Recommendation (R)	Label information[a]	Information level
6.5.2	Battery chemistry	Annex XIII (1b)	Public	String	M	X	Model
6.5.3	Critical raw materials	Annex XIII (1b)	Public	String	M	X	Model
6.5.4	Materials used in cathode, anode and electrolyte	Annex XIII (2a)	PLI and Commission	String	M	—	Model
6.5.5	Hazardous substances	Annex XIII (1b)	Public	String	M	X	Model
6.5.6	Impact of substances on environment, human health, safety, persons	Article 74 (1f)	Public	String	M	—	Model

[a] To define and establish the rules and harmonised specifications for the labelling and marking requirements, BattReg Article 13(10) states that the European Commission will adopt implementing acts by 18 August 2025.

6.5.2 Battery chemistry

a) The battery passport must contain information on the battery chemistry of the battery.

b) The battery chemistry must also be provided on the battery label (see 5.3).

c) The information on the battery chemistry must relate to the battery model.

d) The information on the battery chemistry must be accessible to the public.

e) The battery chemistry should relate to the naming of the cathode, anode, and electrolyte of the battery.

NOTE The exact reporting on the battery chemistry, is not clearly defined via a concrete, unambiguous nomenclature or acronyms. For this, a standard could be developed. This can be based on existing, but not yet exhaustive standards such as DIN EN 61960-3 (VDE 0510-3), DIN EN IEC 62902 (VDE 0510-902), DIN EN IEC 60086-1 (VDE 0509-86-1), or DIN EN IEC 60086-4 (VDE 0509-4).

6.5.3 Critical raw materials

a) The battery passport must contain information on the critical raw materials present in the battery.

b) The information on the critical raw materials must also be provided on the battery label (see 5.3).

c) The information on the critical raw materials must relate to the battery model.

d) The information on the critical raw materials must be accessible to the public.

e) Per Annex VI, Part A(10), critical raw materials must be reported if present in the battery in a concentration of more than 0,1 % weight by weight.

NOTE 1 Critical raw materials are defined by the European Commission, which updates its list of critical raw materials every three years. The latest list of raw materials classified as critical can be drawn from the "Raw Materials Information System" (RMIS) of the EU Science Hub[7].

NOTE 2 To define and establish the rules and harmonised specifications for the labelling and marking requirements, BattReg Article 13(10) states that the European Commission will adopt implementing acts by 18 August 2025.

6.5.4 Materials used in cathode, anode and electrolyte

a) The battery passport must contain information on the detailed composition of the battery.

b) Information on the detailed composition must include materials used in the cathode, anode and electrolyte.

c) Information on the detailed composition must relate to the battery model.

d) Information on the detailed composition must be accessible to persons with legitimate interest and the Commission[8].

NOTE 1 The access group of persons with legitimate interest will be defined in implementing acts.

e) Access to this information should be additionally, at least, provided to sorters, dismantlers, and recyclers.

7 RMIS – Raw Materials Information System, accessible via: https://rmis.jrc.ec.europa.eu/rmp/.

8 See recommendations.

f) A "material" should relate to the composition of its constituent chemical components in order to report on the detailed composition of a battery model by specifying the materials used in the entire battery.

g) Materials should be reported for the as-built battery.

h) Materials in the battery should be reported above a concentration of 1 % weight by weight. Thereby, the threshold of 1 % should be determined as the overall content of the material in the battery in relation to the mass of the entire battery, as defined per technical documentation referred to in Annex VIII.

i) The mass of the materials used should be reported for a battery model.

j) The mass should be specified in terms of kg of a material in the entire battery, as defined per technical documentation referred to in BattReg Annex VIII.

k) The materials should be named using a public standard or agreed nomenclature, which refers e.g. to the nomenclature of IUPAC or related identifiers such as the CAS (Chemical Abstracts Service) number.

NOTE 2 The level of required accuracy and accepted averages for the reporting of the materials' mass is not defined yet and could be specified.

6.5.5 Hazardous substances

a) The battery passport must contain information on hazardous substances other than mercury, cadmium, or lead contained in the battery.

b) The information on hazardous substances must also be provided on the battery label (see 5.3).

NOTE 1 To define and establish the rules and harmonised specifications for the labelling and marking requirements, BattReg Article 13(10) states that the European Commission will adopt implementing acts by 18 August 2025.

c) The information on hazardous substances must relate to the battery model.

d) The information on hazardous substances must be accessible to the public.

e) The definition of hazardous substances in Regulation EC No 1272/2008 ("CLP Regulation") should be used and physical, health, environmental, and additional hazards reported on.

f) The substances should be classified with reference to the classification list and hazard class tables of the EC Regulation No 1272/2008.

g) Hazardous substances also being substances of very high concern, as defined under the Regulation EC No 1907/2006 ("REACH Regulation") should be reported on if exceeding a threshold of 0,1 % weight by weight.

NOTE 2 For those hazardous substances not being classified as substances of very high concern, a threshold is not defined yet and could be specified.

h) Hazardous substances also being substances of very high concern (as introduced in the Regulation EC No 1907/2006 ("REACH Regulation") should be specified as such.

i) Substances should be reported on as chemical element and its compounds in the natural state or obtained by any manufacturing process, as per Regulations EC No 1907/2006 and EC No 1272/2008.

j) A nomenclature for hazardous substances should relate to the nomenclature of IUPAC, as required under Regulation EC No 1907/2006. Other identifiers such as the CAS (Chemical Abstracts Service) or EC number can be added if available.

k) The hazards of the substances should be specified.

l) BattReg Article 74(3) states that the location of the hazardous substances in the battery must be identified. This requirement needs to be provided upon request even though it is not specifically for the battery passport and can be integrated.

m) The mass of the hazardous substances should be reported for a battery model. The mass can be reported in terms of kg of a material and in terms of the concentration of weight by weight % in the entire battery, as defined per technical documentation referred to in Annex VIII. The SCIP guidance for concentration ranges should be used.

NOTE 3 The level of required accuracy and accepted averages for the reporting of the materials' mass is not defined yet and should be specified.

6.5.6 Impact of substances on environment, human health, safety, persons

a) The battery passport must contain information on the impact of substances, in particular hazardous substances, present in batteries. Hereby the impact on the environment and on human health or the safety of persons is considered and includes the impact due to inappropriate discarding of waste batteries, such as littering or discarding as unsorted municipal waste.

b) The information on impact of substances must relate to battery model.

c) The information on impact of substances must be accessible to the public.

d) The classification for "hazardous substances" should be defined as per Regulation EC No 1272/2008 ("CLP Regulation").

e) The impact should be described by using commonly used statements, which can be reported by hazard (H) phrases and precautionary (P) statements as per Regulation EC No 1272/2008 ("CLP Regulation").

f) The impact should be reported as required per Regulation EC No 1907/2006 ("REACH Regulation") registration obligations.

6.6 Circularity and resource efficiency

6.6.1 Circularity information

6.6.1.1 Overview

Table 7 shows the data attributes regarding circularity information.

Table 7 — Circularity information — data attributes

Clause	Data attribute	BattReg reference	Data access	Data type [Unit]	Mandatory (M)/ Recommendation (R)	Information level
6.6.1.2	Dismantling information: Manuals for the removal and the disassembly of the battery pack	Annex XIII (2c)	PLI and Commission	Link to PDF	M	Model
6.6.1.3	Part numbers for components	Annex XIII (2b)	PLI and Commission	URL	M	Model
6.6.1.4	Postal address of sources for spare parts	Annex XIII (2b)	PLI and Commission	Text	M	Model
6.6.1.4	E-mail address of sources for spare parts	Annex XIII (2b)	PLI and Commission	Text	M	Model

Table 7 (*continued*)

Clause	Data attribute	BattReg reference	Data access	Data type [Unit]	Mandatory (M)/ Recommendation (R)	Information level
6.6.1.4	Web address of sources for spare parts	Annex XIII (2b)	PLI and Commission	URL	M	Model
6.6.1.5	Safety measures	Annex XIII (2d)	PLI and Commission	Link to PDF	M	Model
NOTE None of the data attributes are intended for the label.						

6.6.1.2 Dismantling information: Manuals for the removal and the disassembly of the battery pack

a) A battery passport must include dismantling information.

b) The dismantling information must relate to the battery model.

c) The information must be accessible only to persons with a legitimate interest and the Commission.

d) The dismantling information must include:

— 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 and

— amount of cells used and layout.

e) The dismantling information required by the EU Battery Regulation should be integrated into two separate manuals, a manual for the removal of the battery pack and a manual for the disassembly of the battery pack.

NOTE 1 The term “dismantling” is associated with end-of-life operations, e.g., the recycling of the battery, and can cause damage to the battery. By contrast, “disassembly” means the non-destructive handling of the battery – to prepare the battery for maintenance, re-use, repair, refurbishment, and remanufacturing operations. For this reason, the term “disassembly” is used.

NOTE 2 Depending on the appliance, manual for the removal of the battery pack and manual for the disassembly of the battery pack can be combined in one manual.

f) The URL to both manuals should be provided by the battery passport.

g) The manual for the removal of the battery pack and the manual for disassembly of the battery pack should be machine-readable whenever possible.

h) The manual for the removal of the battery pack should include:

— information on whether it is possible to remove the battery from the appliance or not;

— removal sequences;

— characteristics of the joints, screws, and fasteners: type, number, materials and number of fastening techniques to be unlocked;

— electrical and electromechanical interfaces important for the removal from the appliance;

— tools required for battery removal;

— risk warnings and safety measures.

i) The manual for disassembly of the battery pack should include:

— information on whether it is possible to disassemble the battery pack;

If disassembly of the battery pack is possible, information on the re-assembly of the battery should also be provided.

— information on replaceability of modules and cells (replacement possible or not possible);

If replacement of modules and cells is possible, information on the replacement steps should be provided.

— exploded diagrams of the battery system/pack showing the location of the battery cells and modules, including format and dimensions of battery cells, modules and pack, and orientation of the battery cells;

— type of construction of battery pack, modules, and cells;

— disassembly sequences;

— characteristics of joints, screws, and fasteners: type, number, materials, and number of fastening techniques to be unlocked;

— electrical and electromechanical interfaces important for the disassembly and dismantling process;

— information on fillings, if used: characteristics of foams and/or glues;

— information on casing: type and material (steel/plastic);

— tools required for disassembly;

— risk warnings and safety measures.

6.6.1.3 Part numbers for components

a) A battery passport must include part numbers for components.

b) The information on part numbers for components must relate to the battery model.

c) The information must be accessible only to persons with a legitimate interest and the Commission.

d) The part numbers for components should be provided together with the postal address, e-mail address and web address of the sources for spare parts.

6.6.1.4 Information on sources of spare parts: Postal, email and website address

a) A battery passport must include contact details of sources for spare parts (replacement spares).

b) The information must relate to the battery model.

c) The information must be accessible only to persons with a legitimate interest and the Commission.

d) As part of their contact details, economic operators should indicate a postal and, if available, email and website address.

e) The postal address, e-mail address and web address of the sources for spare parts should be provided together with the part numbers of components.

f) The information on spare parts should be provided within the two manuals above.

6.6.1.5 Safety measures

a) A battery passport must include safety measures.

b) The information on safety measures must relate to the battery model.

c) The information must be accessible only to persons with a legitimate interest and the Commission.

d) The safety measures should be provided via the instruction manual as URL linking to PDF.

6.6.2 Recycled and renewable content

6.6.2.1 Overview

Table 8 shows the data attributes regarding the recycled and renewable content.

Table 8 — Recycled and renewable content — data attributes

Clause	Data attribute	BattReg reference	Data access	Data type [Unit]	Mandatory (M)/ Recommendation (R)	Information level
6.6.2.2	Pre-consumer and post-consumer recycled cobalt, lithium, nickel, and lead share	Annex XIII (1e); Article 8(1)	Public	[%]	M	Model
6.6.2.3	Pre-consumer recycled nickel share	Annex XIII (1e); Article 8(1)	Public	[%]	M	Model
6.6.2.4	Pre-consumer recycled cobalt share	Annex XIII (1e); Article 8(1)	Public	[%]	M	Model
6.6.2.5	Pre-consumer recycled lithium share	Annex XIII (1e); Article 8(1)	Public	[%]	M	Model
6.6.2.6	Pre-consumer recycled lead share	Annex XIII (1e); Article 8(1)	Public	[%]	M	Model
6.6.2.7	Post-consumer recycled nickel share	Annex XIII (1e); Article 8(1)	Public	[%]	M	Model
6.6.2.8	Post-consumer recycled cobalt share	Annex XIII (1e); Article 8(1)	Public	[%]	M	Model
6.6.2.9	Post-consumer recycled lithium share	Annex XIII (1e); Article 8(1)	Public	[%]	M	Model
6.6.2.10	Post-consumer recycled lead share	Annex XIII (1e); Article 8(1)	Public	[%]	M	Model
6.6.2.11	Renewable content share	Annex XIII (1f)	Public	[%]	M	Model

6.6.2.2 Pre-consumer and post-consumer recycled cobalt, lithium, nickel, and lead share

a) A battery passport must include recycled content information.

b) The content information must include the percentage share of cobalt, lithium or nickel that is present in active materials and that has been recovered from battery manufacturing waste or post-consumer waste, and the percentage share of lead that is present in the battery and that has been recovered from waste, for each battery model per year and per manufacturing plant.

Annex C, Table C.1 lists the mandatory recycled content targets for battery materials according to the EU Battery Regulation.

The Battery Regulation defines pre-consumer waste or "battery manufacturing waste" as "the materials or objects rejected during the battery manufacturing process, which cannot be re-used as an integral part in the same process and need to be recycled" (see BattReg Article 3, 1(51)). Post-consumer material[9] is defined in DIN EN ISO 14021 as the "material generated by households or by commercial, industrial, and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose. This includes returns of material from the distribution chain."

NOTE 1 Depending on future material availabilities, market developments and technological progress, further materials might be included in the scope for recycled content.

c) The information must relate to the battery model.

d) The information must be accessible to the public.

e) The recycled content shares from pre-consumer waste and post-consumer waste of cobalt, lithium, nickel in active materials and lead present in the battery should be calculated and declared separately.

NOTE 2 BattReg Article 8(1) states that by 18 August 2026, the Commission will adopt a delegated act for industrial batteries > 2 kWh, except those with exclusively external storage, EV batteries and SLI batteries that contain cobalt, lead, lithium or nickel in active materials to establish the methodology for the calculation and verification of the percentage share of cobalt, lithium or nickel that is present in active materials and that has been recovered from battery manufacturing waste or post-consumer waste, and the percentage share of lead that is present in the battery and that has been recovered from waste, and the format for the documentation.

6.6.2.3 Pre-consumer recycled nickel share

See 6.6.2.2.

6.6.2.4 Pre-consumer recycled cobalt share

See 6.6.2.2.

6.6.2.5 Pre-consumer recycled lithium share

See 6.6.2.2.

9 The terminology used in EU law and standardisation with respect to the definition of "waste" differs. Standards define that "waste" cannot exercise any further functions and cannot be recovered. In all other cases the term "material" is preferably used in standards. Accordingly, DIN EN ISO 14021:2021-10 defines pre-consumer material as "material diverted from the waste stream during a manufacturing process. Excluded is reutilisation of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it", thus corresponding to the term "manufacturing waste" used in the EU Battery Regulation.

6.6.2.6 Pre-consumer recycled lead share

See 6.6.2.2.

6.6.2.7 Post-consumer recycled nickel share

See 6.6.2.2.

6.6.2.8 Post-consumer recycled cobalt share

See 6.6.2.2.

6.6.2.9 Post-consumer recycled lithium share

See 6.6.2.2.

6.6.2.10 Post-consumer recycled lead share

See 6.6.2.2.

6.6.2.11 Renewable content share

Most battery components are mineral-based. However, some components are replaceable by biobased material, for example nanocellulose-based materials, both for electrolytes and separator.

EXAMPLE Tree-based lignin can replace graphite in the anode as renewable material in batteries.

a) A battery passport must include information about the share of renewable content.

b) The information on renewable content must relate to the battery model.

c) The information must be accessible to the public.

d) If the proportion of renewable content is greater than zero, specifications about which material is involved and its content shall be determined.

6.6.3 Information on role of end-users in waste prevention and information on battery collection, preparation for second life and on treatment at end of life

6.6.3.1 Overview

Table 9 shows the data attributes regarding the role of end-users in waste prevention and collection.

Table 9 — Role of end-users in waste prevention and collection — data attributes

Clause	Data attribute	BattReg reference	Data access	Data type [Unit]	Mandatory (M)/ Recommendation (R)
6.6.3.2	Information on the role of end-users in contributing to waste prevention	Annex XIII (1s), Article 74(1a)	Public	Link to PDF	M
6.6.3.3	Information on the role of end-users in contributing to the separate collection of waste batteries	Annex XIII (1s), Article 74(1b)	Public	Link to PDF	M
6.6.3.4	Information on battery collection, preparation for second life and on treatment at end of life	Annex XIII (1s), Article 74(1c)	Public	Link to PDF	M

6.6.3.2 Information on the role of end-users in contributing to waste prevention

a) A battery passport must include information on the role of end-users in contributing to waste prevention.

b) The information must include good practices and recommendations concerning the use of batteries aimed at extending their use phase and the possibilities of re-use, preparation for re-use, preparation for repurposing, repurposing and remanufacturing.

c) The information must relate to the battery model.

d) The information must be accessible to the public.

e) General information on the role of the end-users in waste prevention and information on good practices and recommendations concerning the use of batteries aiming at extending their use-phase should be provided as link to PDF.

6.6.3.3 Information on the role of end-users in contributing to the separate collection of waste batteries

End-users are obliged to "discard waste batteries separately from other waste streams, including from mixed municipal waste" (see BattReg Article 64(1)) and "in designated separate collection points set up by, or in accordance with the specific arrangements concluded with, the producer or a producer responsibility organisation […]" (see BattReg Article 64(2)).

a) A battery passport must include information on the role of end-users in contributing to the separate collection of waste batteries.

b) The information must relate to the battery model.

c) The information must be accessible to the public.

d) Information on the practical role of the end-users in contributing to the separate collection of waste batteries should be provided as link to PDF.

6.6.3.4 Information on battery collection, preparation for second life and on treatment at end of life

a) A battery passport must include information on the separate collection, take-back and collection points, preparation for re-use, preparation for repurposing and treatment available for waste batteries.

b) The information must relate to the battery model.

c) The information must be accessible to the public.

d) The location of collection points, a description of the take-back process, preparation for re-use, preparation for repurposing and treatment available should be provided as link to PDF.

6.7 Performance and durability

6.7.1 General

Figure 5 describes the cross references including the source information of performance and durability requirements of requirements originating from the EU Battery Regulation, while in the following the text will only mention the respective Annexes as origin of the requirement without tracing the entire cross-reference back to BattReg Annex XIII.

NOTE 1 Mandatory requirements for performance and durability data in the battery passport are described in BattReg Annex XIII, 1 and 4, where cross-references to BattReg Article 10/Annex IV and BattReg Article 14/Annex VII are made.

'State of health' means a measure of the general condition of a rechargeable battery and its ability to deliver the specified performance compared with its initial condition" (see BattReg Article 3 (28)). However, the parameters for measuring the state of health (SoH) vary among different battery categories and are not defined for other industrial batteries than stationary battery energy storage systems (see BattReg Article 14 and Annex VII).

As per BattReg Annex VII, Part A the SoH for EV batteries is defined as the state of certified energy (SOCE, see 6.7.2.7).

For LMT batteries and stationary battery energy storage systems, SoH is understood as a combination of different performance data (see BattReg Annex VII Part A):

— the remaining capacity (see 6.7.2.3);

— where possible, the remaining power capability (see 6.7.3.3);

— where possible, the remaining round trip efficiency (see 6.7.4.4);

— the evolution of self-discharging rates (see 6.7.4.6 to 6.7.4.8); and

— where possible, the internal (or "ohmic") resistance (see 6.7.5.3).

NOTE 2 This combination of parameters for the SoH is not well aligned with the definition for remanufacturing, which describes a percentage of SoH deviation as a criterion for remanufacturing. This definition should be revised to include a more complicated approach for non-EV batteries.

NOTE 3 The standardisation request M/579 states that the determination of dynamic data must be possible without external equipment and applies to batteries using a BMS.

For other industrial batteries (except BESS), parameters that represent the SoH are not explicitly defined.

Performance and durability data attributes should be accompanied by metadata that include date and originator of the data as well as measurement uncertainty and information on the test method applied to provide transparency on the merit of the data.

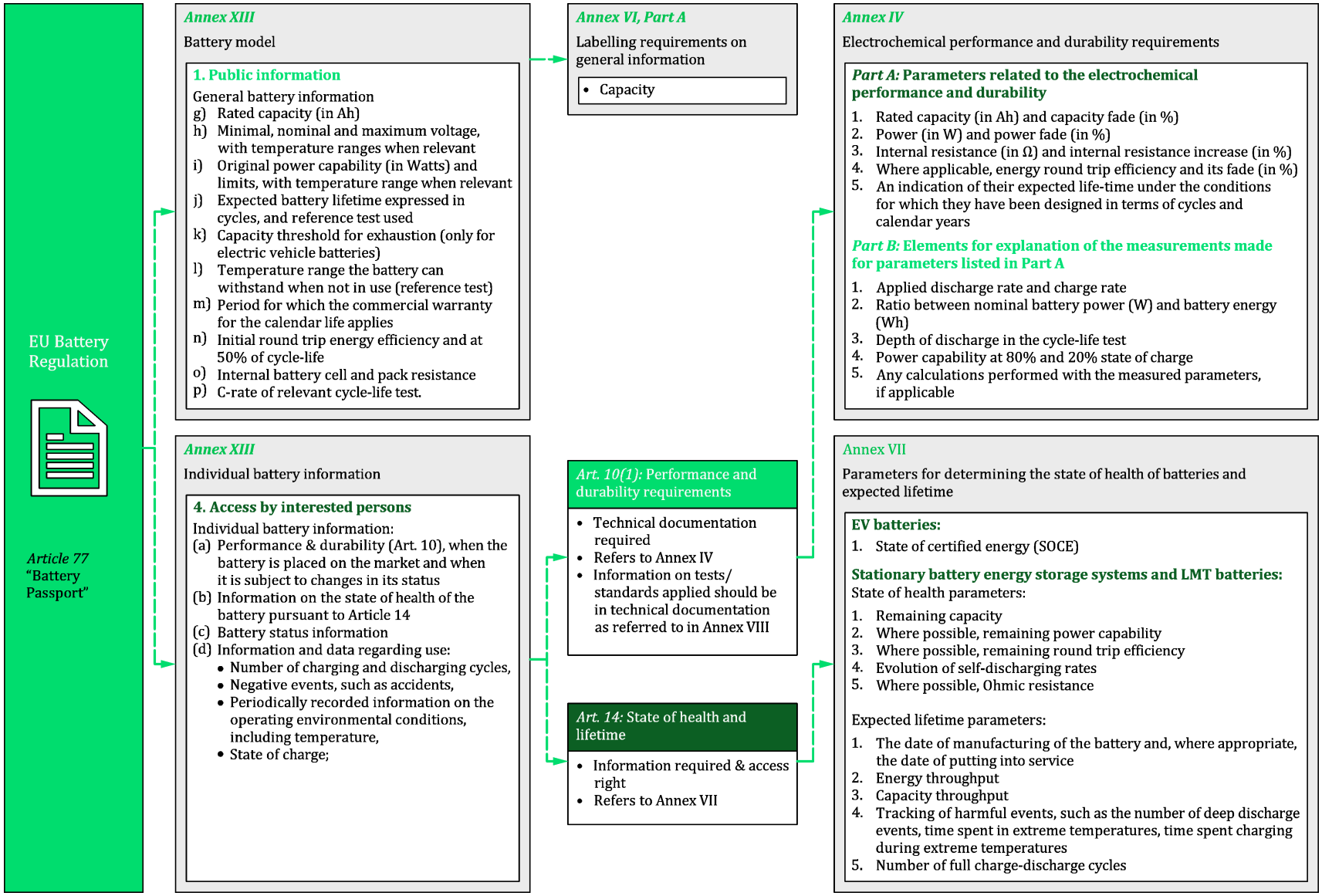

Figure 5 — Cross references including the source information of performance and durability requirements

6.7.2 Capacity, energy, and voltage

6.7.2.1 Overview

Table 10 contains an overview of the battery passport data attributes related to battery capacity, energy and voltage.

Table 10 — Data attributes with regard to battery capacity, energy and voltage

Clause	Data attribute	BattReg reference	Data access[a]	Mandatory (M)/ Recommended (R)	Data type [Unit]	Static/ Dynamic[b]	Information level
6.7.2.2	Rated capacity	Annex IV, Part A(1), incl. definition. Annex XIII 1(g)	Public	M	Decimal [Ah]	S	Model
6.7.2.3	Remaining capacity[c]	Annex VII, Part A(1)	PLI	M for stationary BESS and LMT batteries using a BMS R for all batteries[d]	Decimal [Ah]	D	Item
6.7.2.4	Capacity fade	Annex IV, Part A(1), incl. definition.	PLI	M	Integer [%]	S	Model
6.7.2.5	Certified usable battery energy	Added by consortium, based on UN GTR No 22	PLI	R for EV batteries	Decimal [kWh]	S	Model
6.7.2.6	Remaining usable battery energy	Added by consortium, based on UN GTR No 22	PLI	R for EV batteries	Decimal [kWh]	D	Item
6.7.2.7	State of certified energy (SOCE)	UN GTR No 22 Annex VII, Part A	PLI	M only for EV using a BMS	Integer [%]	D	Item
6.7.2.8	State of charge (SoC)	Annex XIII 4(d) Definition in Article 3, 1(27) and Standardisation request M/579	PLI	M	Integer [%]	D	Item
6.7.2.9	Minimum voltage	Annex XIII 1(h)	Public	M	Decimal [V]	S	Model
6.7.2.10	Maximum voltage	Annex XIII 1(h)	Public	M	Decimal [V]	S	Model
6.7.2.11	Nominal voltage	Annex XIII 1(h)	Public	M	Decimal [V]	S	Model

'Rated capacity' is the only data point of 6.7.2 that must also be on the label.

[a] Access is derived from the respective wording of the Battery Regulation or categorised analogously to similar parameters, if added by the consortium. Abbreviation: PLI = Persons with legitimate interest.

[b] Abbreviations: S = Static, D = Dynamic.

[c] This data attribute forms part of the state of health combination of parameters for LMT and stationary battery energy storage systems (stationary BESS).

[d] Batteries within battery passport scope: Industrial (> 2 kWh), LMT and EV batteries; BESS: Battery energy storage systems.

6.7.2.2 Rated capacity

'Rated capacity' is the total number of ampere-hours (Ah) that can be withdrawn from a fully charged battery under reference conditions (see BattReg Annex IV (1)).

a) The battery passport must include information about the rated capacity.

b) The unit must be Ah.

c) The information on rated capacity must relate to the battery model.

d) The information on rated capacity must be accessible to the public.

e) The update interval shall be upon placement on the market and change of status.

f) The test method and reference conditions for measurement should include, among others, the battery charge and discharge rate, the resting period between charge and discharge as well as the operating temperature.

NOTE Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

6.7.2.3 Remaining capacity

The remaining capacity is the corresponding in-use data attribute to rated capacity.

a) The battery passport must include information on the remaining capacity as information on the state of health of the battery pursuant to BattReg Article 14 for stationary BESS and LMT batteries using a BMS.

b) The definition of remaining capacity shall consider the definition of rated capacity (6.7.2.2) to ensure comparability.

c) The information on remaining capacity shall be dynamic.

NOTE 1 The mandatory required update interval for remaining capacity is subject to further elaboration by the European Commission, potentially as part of a delegated act (see BattReg Article 77(2)).

d) The information on remaining capacity must relate to the battery item.

e) The information on remaining capacity must be accessible to persons with a legitimate interest.

f) The unit should be Ah.

g) The test method and reference conditions for measurement should include, among others, the battery charge and discharge rate in terms of rated capacity (C-rate), the resting period in between charge and discharge as well as the operating temperature.

NOTE 2 Test methods and reference conditions are subject of the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

6.7.2.4 Capacity fade

The capacity fade is the "Decrease over time and upon usage in the amount of charge that a battery can deliver at the rated voltage, with respect to the original rated capacity" (see BattReg Annex IV (2)) as declared by the manufacturer.

a) The battery passport must include information on the capacity fade.

b) The unit must be %.

c) The information on capacity fade must relate to the battery model[10] (see standardization request M/579).

d) The information on capacity fade must be accessible to persons with a legitimate interest.

e) The capacity fade must be updated upon change of the battery status, which is described in 6.1.3.7.

f) The update interval must be upon placement on the market and change of status.

NOTE 1 Due to the static nature of the data attribute, the change of status is associated with a new placement on market.

g) Capacity fade should be calculated in accordance with ISO 12405-4:2018, using the formula below:

$$C_{\text{fade}}(x) = \left(1 - \frac{C(x)}{C_{\text{BOL}}}\right) \times 100\,\%$$

where

x is the aging parameter (e.g. storage time, number of cycles, etc.);

$C(x)$ is the capacity at aging parameter x;

C_{BOL} is the capacity at begin of life.

NOTE 2 Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

NOTE 3 The capacity fade typically starts with 0 % at begin of life.

6.7.2.5 Certified usable battery energy

The certified usable battery energy is the usable battery energy according to the procedure in the UN GTR No 22 as determined during the certification of the vehicle.

The certified usable battery energy is not mandated by the BattReg. Nevertheless, the battery passport should include information on the certified usable battery energy for EV batteries as it is the base for the SOCE calculation.

a) The certified usable battery energy should be stated in kWh.

b) The information on certified usable battery energy should relate to the battery model.

c) The information on certified usable battery energy should be accessible to persons with a legitimate interest.

6.7.2.6 Remaining usable battery energy

The remaining usable battery energy is the usable battery energy at the present point in the lifetime of a battery as determined according to the procedure in the UN GTR No 22.

10 The standardisation request M/579 by the Commission diverges here from the BattReg, which lists this data attribute on battery item level. This document therefore refers to the requirement from standardisation request M/579.

The remaining usable battery energy is not mandated by the BattReg. Nevertheless, the battery passport should include information on the remaining usable battery energy for EV batteries as it is useful in context of SOCE and needed for its calculation.

a) The remaining usable battery energy should be stated in kWh.

b) The information on remaining usable battery energy should be dynamic.

c) The information on remaining usable battery energy should relate to the battery item.

d) The information on remaining usable battery energy should be accessible to persons with a legitimate interest.

e) The update interval and its definition should be aligned with the update interval of the SOCE (see 6.7.2.7).

6.7.2.7 State of certified energy (SOCE)

The state of certified energy SOCE is defined as the measured or on-board usable battery energy performance at a specific point in its lifetime, expressed as a percentage of the certified usable battery energy.

a) The battery passport for EV batteries using a BMS only must include information on the SOCE as information on the state of health of the battery pursuant to BattReg Article 14 for individual batteries.

b) The information on SOCE shall be dynamic.

c) The information on SOCE must relate to the battery item.

d) The information on SOCE must be accessible to persons with a legitimate interest.

e) SOCE shall be expressed as a percentage of the certified usable battery energy (see 6.7.2.5).

f) The unit shall be %.

g) The SOCE shall be reported based on the conditions laid out in the UN GTR No 22.

NOTE 1 The reporting on SOCE is also required by the new regulation on type-approval of motor vehicles and engines and of systems, components and separate technical units intended for such vehicles, with respect to their emissions and battery durability (Euro 7).

NOTE 2 The mandatory required update interval for the SOCE is subject to further elaboration by the European Commission, potentially as part of a delegated act (see BattReg Article 77(2)).

6.7.2.8 State of charge (SoC)

'State of charge' means the available energy or charge in a battery expressed as a percentage of rated capacity as declared by the manufacturer. When the battery's state of health is no longer equal to its initial condition, SoC refers to the maximum energy or charge that can be stored in the battery at the time of charging; (see BattReg Article 3, 1(27) and Standardization request M/579).

a) The battery passport shall include the state of charge (SoC) of the battery.

b) The unit shall be %.

c) The information on SoC shall be dynamic.

NOTE 1 The mandatory required update interval for the SoC is subject to further elaboration by the European Commission, potentially as part of a delegated act (see BattReg Article 77(2)).

NOTE 2 Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

d) The information on SoC must relate to the battery item.

e) The information on SoC must be accessible to persons with a legitimate interest.

The following recommendation is made:

— The information on the SoC should additionally be reported by use of a histogram that represents the time spent in specific SoC intervals covering the entire range of SoC values. The BMS should aggregate the time spent in each SoC interval from values during operation of the battery.

6.7.2.9 Minimum voltage

The minimum voltage is the lower voltage limit that the safe operation of the battery is rated for.

a) The battery passport must include information on the minimal voltage, with temperature ranges when relevant.

b) The unit shall be V.

c) The information on minimum voltage must relate to the battery model.

d) The information on minimum voltage must be accessible to the public.

e) The temperature range, in which the provided minimal voltage applies, should be reported in °C.

6.7.2.10 Maximum voltage

The maximum voltage relates to the upper voltage limit that the safe operation of the battery is rated for.

a) The battery passport must include information about the maximum voltage, with temperature ranges when relevant.

b) The unit shall be V.

c) The information on maximum voltage must relate to the battery model.

d) The information on maximum voltage must be accessible to the public.

e) The temperature range, in which the provided maximum voltage applies, should be reported in °C.

6.7.2.11 Nominal voltage

The nominal voltage is the suitable approximate value of the voltage used to designate or identify the battery.

a) The battery passport must include information about the nominal voltage, with temperature ranges when relevant.

b) The unit shall be V.

c) The information on nominal voltage must relate to the battery model.

d) The information on nominal voltage must be accessible to the public.

6.7.3 Power capability

6.7.3.1 Overview

Table 11 shows the data attributes regarding power capability.

Table 11 — Data attributes regarding power capability

Clause	Data attribute	BattReg reference	Data access[a]	Format/ Unit	Date Type[b]	Mandatory (M)/ Recommended (R)	Information level
6.7.3.2	Original power capability	Annex XIII (1i), Annex IV Part A (2) Annex IV, Part B(4)	Public	Integer [W]	S	M	Model
6.7.3.3	Remaining power capability[c]	Annex VII, Part A(2); Annex IV, Part B(4)	PLI	Integer [W]	D	M for stationary BESS and LMT batteries using a BMS (where possible) R for all batteries[d]	Item
6.7.3.4	Power fade	Annex IV, Part A(2) Annex IV, (4) (definition)	PLI	Integer [%]	S	M	Model
6.7.3.5	Maximum permitted battery power	Annex XIII (1i)	Public	Integer [W]	S	M	Model
6.7.3.6	Ratio between nominal battery power and battery energy	Annex IV, Part B(2)	PLI	Decimal [W/Wh]	S	R for all batteries[d]	Model

[a] Access is derived from the respective wording of the Battery Regulation or categorised analogously to similar parameters, if added by the consortium. Abbreviation: PLI = Persons with legitimate interest.

[b] Abbreviations: S = Static, D = Dynamic.

[c] This data attribute forms part of the state of health combination of parameters for LMT and stationary battery energy storage systems (stationary BESS).

[d] Batteries within battery passport scope: Industrial (> 2 kWh), LMT and EV batteries; BESS: Battery energy storage systems.

6.7.3.2 Original power capability

The original power capability is the amount of energy that a battery is capable to provide over a given period of time under reference conditions (see BattReg Annex IV (3)).

NOTE 1 Separate instances of differently worded requirements, i.e. “power” and “original power capability” have been subsumed in this data attribute.

a) The battery passport must include information about the original power capability […], with temperature range when relevant.

   NOTE 2 The qualifier ‘when relevant’ is not further defined by regulation yet.

b) The unit must be Watt (W).

c) The information on original power capability must relate to the battery model.

d) The information on original power capability must be accessible to the public.

e) Power capability shall be measured at reference conditions, which must include measurements at 80 % and 20 % state of charge for EV and industrial batteries.

   NOTE 3 Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

f) The temperature range, in which the provided maximum voltage applies, should be provided in the unit °C.

g) The test method and reference conditions should, among others, include the charge and discharge rate in terms of rated capacity (C-rate), the duration and the voltage at the point of measurement.

6.7.3.3 Remaining power capability

a) The battery passport must, where possible, contain information on the remaining power capability as information on the state of health of the battery pursuant to BattReg Article 14 for stationary BESS and LMT batteries using a BMS.

   NOTE 1 The exemption granted by “where possible” might be subject of a delegated act (see BattReg Article 77(2)).

b) The remaining power capability must relate to the battery item.

c) The remaining power capability must be accessible for persons with a legitimate interest.

d) The remaining power capability shall be dynamic.

   NOTE 2 The mandatory required update interval for remaining power capability is subject to further elaboration by the European Commission, potentially as part of a delegated act (see BattReg Article 77(2)).

e) Power capability shall be measured at reference conditions, which, among others, must include the measurement at 80 % and 20 % SoC.

   NOTE 3 The reference to SoC in the measurement method of power capability may be ill defined for dynamic data because an SoC of 80 %, which is defined relative to rated capacity (6.7.2.2), will not be available after degradation of the battery capacity to below 80 % of rated capacity.

   NOTE 4 Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

f) The unit should be Watt (W).

6.7.3.4 Power fade

"Power fade (in %) means the decrease over time and upon usage in the amount of power that a battery can deliver at the rated voltage." (see BattReg Annex IV (4)).

a) The battery passport must contain information on the power fade.

b) The unit must be %.

c) The information on power fade must relate to the battery model[11] (see standardization request M/579).

d) The information on power fade must be accessible for persons with a legitimate interest.

e) The update interval must be upon placement on the market and upon change of the battery status, which is described in 6.1.3.7.

NOTE 1 Due to the static nature of the data attribute, the change of status is associated with a new placement on market.

NOTE 2 Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

f) Power fade should be calculated using original and remaining power capability following the formula below:

$$P_{\text{fade}}(x) = \left(1 - \frac{P(x)}{P_{\text{BOL}}}\right) \times 100\,\%$$

where

x is the aging parameter (e.g. storage time, number of cycles, etc.);

$\mathrm{P}(x)$ is the power capability at aging parameter x;

$\mathrm{P}_{\mathrm{BOL}}$ is the power capability at begin of life.

NOTE 3 The power fade typically starts with 0 % at begin of life.

6.7.3.5 Maximum permitted battery power

This data point describes the value of maximum permitted power the battery is rated for and reflects the data relevant for power limits.

a) The battery passport must include information about the original power capability and limits, with temperature range when relevant.

NOTE 1 The maximum permitted battery power implements the words "and limits", as mentioned above, but has not been defined specifically in the battery regulation.

b) The unit must be Watt [W].

c) The information on maximum permitted battery power must relate to the battery model.

11 The standardisation request M/579 by the Commission diverges here from the BattReg, which lists this data attribute on battery item level. This document therefore refers to the requirement from standardisation request M/579.

d) The information on maximum permitted battery power must be accessible to the public.

NOTE 2 Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

e) The maximum permitted battery power should be defined as the upper power limit that the safe operation of the battery is rated for.

f) The temperature range, in which the provided maximum permitted battery power applies, should be provided in unit °C.

6.7.3.6 Ratio between nominal battery power and battery energy

The nominal battery power is the suitable approximate value of the power capability used to designate or identify the battery, while the battery energy is determined in reference conditions to be defined.

a) As a non-mandatory data point the battery passport should include the ratio between nominal battery power in W and battery energy in Wh. It aims to provide an indication of the applicable discharge and charge rate in terms of rated capacity (C-rate) (see BattReg Annex IV Part B(2)).

b) The unit should be W/Wh.

c) The information on ratio between nominal battery power and battery energy should relate to the battery model.

d) The information should be accessible to the public.

e) The update interval should be upon placement on the market and upon change of the battery status, which is described in 6.1.3.7.

NOTE Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

6.7.4 Round trip energy efficiency and self-discharge

6.7.4.1 Overview

Table 12 shows the data attributes regarding round trip energy efficiency.

Table 12 — Data attributes regarding round trip energy efficiency

Clause	Data attribute	BattReg reference	Data access[a]	Data type [Unit]	Static/ Dynamic[b]	Mandatory (M)/ Recommended (R)	Information level
6.7.4.2	Initial round trip energy efficiency	Annex XIII (1n) Annex IV, Part A(4) (definition only)	Public	Integer [%]	S	M	Model
6.7.4.3	Round trip energy efficiency at 50 % of cycle-life	Annex XIII (1n) Annex IV, Part A(4) (definition only)	Public	Integer [%]	S	M	Model
6.7.4.4	Remaining round trip energy efficiency[c]	Annex VII, Part A(3)	PLI	Integer [%]	D	M for stationary BESS and LMT batteries using a BMS (where possible)	Item
6.7.4.5	Energy round trip efficiency fade	Annex IV, Part A(4)	PLI	Integer [%]	S	M (where applicable)	Model
6.7.4.6	Initial self-discharge rate	Annex VII, Part A(4)	PLI	Decimal [%/month]	S	R for stationary BESS using a BMS and LMT	Model
6.7.4.7	Current self-discharge rate	Annex VII, Part A(4)	PLI	Decimal [%/month]	D	R for stationary BESS using a BMS and LMT	Item
6.7.4.8	Evolution of self-discharge rates	Annex VII, Part A(4)	PLI	Integer [%]	D	M for stationary BESS using a BMS and LMT	Item

NOTE Test methods and reference conditions of mandatory data attributes are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

[a] Access is derived from the respective wording of the Battery Regulation or categorised analogously to similar parameters, if added by the consortium. Abbreviation: PLI = Persons with legitimate interest.

[b] Abbreviations: S = Static, D = Dynamic.

[c] This data attribute forms part of the state of health combination of parameters for LMT and stationary battery energy storage systems (stationary BESS).

6.7.4.2 Initial round trip energy efficiency

Energy round trip efficiency is the ratio of the net energy delivered by a battery during a discharge test to the total energy required to restore the initial state of charge by a standard charge (see BattReg Annex IV (6)).

a) The battery passport must include information about the initial round trip energy efficiency.

NOTE In a separate instance, information on energy round trip efficiency and its fade in % is required, where applicable (BattReg Annex IV, Part A(4)). However, BattReg Annex XIII (1n) states that the battery passport is required to include information about the initial round trip energy efficiency.

b) The unit should be %.

c) The information on initial round trip energy efficiency must relate to the battery model.

d) The information must be accessible to the public.

e) Initial round trip energy efficiency should be measured at reference conditions.

f) The initial state of charge, referred to in the definition above, should correspond to a fully charged state.

6.7.4.3 Round trip energy efficiency at 50 % of cycle-life

Energy round trip efficiency is the ratio of the net energy delivered by a battery during a discharge test to the total energy required to restore the initial state of charge by a standard charge (see BattReg Annex IV (6)).

a) The battery passport must include information about the round trip energy efficiency at 50 % of cycle-life.

b) The information must be accessible to the public.

c) The information on round trip energy efficiency at 50 % of cycle-life must relate to the battery model.

d) Initial round trip energy efficiency shall be measured at reference conditions that include the specification of “50 % of cycle-life”.

NOTE Measured at 50 % of cycle-life as determined in a pre-use standardised measurement, that must yet be specified.

e) The unit should be %.

f) Test methods and reference conditions should separately consider non-cycle applications and batteries with very long cycle-life.

6.7.4.4 Remaining round trip energy efficiency

Remaining energy round trip efficiency is the in-use analogy to the initial roundtrip energy the ratio of the net energy delivered by a battery during a discharge test to the total energy required to restore the initial state of charge by a standard charge (see BattReg Annex IV (6)).

a) The battery passport shall include information, where possible, about the remaining round trip energy efficiency as information on the state of health of the battery pursuant to Article 14 for stationary BESS and LMT batteries using a BMS.

NOTE 1 The exemption granted by “where possible” might be subject of a delegated act (see BattReg Article 77(2)).

b) The information on remaining round trip energy efficiency shall be dynamic.

c) The information must relate the battery item.

d) The information must be accessible for persons with a legitimate interest.

e) The unit should be %.

f) The update frequency of remaining round trip energy efficiency should be aligned with the update frequency of round trip energy efficiency fade (see 6.7.4.3) and should be provided upon change of the battery status.

NOTE 2 The mandatory required update interval for remaining round trip energy efficiency is subject to further elaboration by the European Commission, potentially as part of a delegated act (see BattReg Article 77(2)).

6.7.4.5 Energy round trip efficiency fade

Energy round trip efficiency fade is the decrease of round trip energy efficiency as percentage.

a) The battery passport must, where applicable, contain information on the energy round trip efficiency fade.

NOTE 1 The exemption granted by "where applicable" might be subject of a delegated act (BattReg Article 77(2)).

b) The unit must be %.

c) The information on energy round trip efficiency fade must relate to the battery model[12] (see standardization request M/579).

d) The information must be accessible for persons with a legitimate interest.

e) The energy round trip efficiency fade must be updated upon placement on the market and change of the battery status, which is described in 6.1.3.7.

NOTE 2 Due to the static nature of the data attribute, the change of status is associated with a new placement on market.

f) Energy round trip efficiency fade should be calculated using the initial round trip energy efficiency and remaining round trip energy efficiency following the formula below:

$$RTE_{\text{fade}}\,(x) = \left(1 - \frac{RTE\,(x)}{RTE_{\text{BOL}}}\right) \times 100\,\%$$

where

x is the aging parameter (e.g. storage time, number of cycles, etc.);

$\text{RTE}(x)$ is the round trip energy efficiency at aging parameter x;

RTE_{BOL} is the round trip energy efficiency at begin of life.

NOTE 3 The round trip energy efficiency fade typically starts with 0 % at begin of life.

6.7.4.6 Initial self-discharge rate

The initial self-discharge rate is the self-discharge-rate in an idle state of the battery in reference conditions (temperature etc.) at begin of life.

12 The standardisation request M/579 by the Commission diverges here from the BattReg, which lists this data attribute on battery item level. This document therefore refers to the requirement from standardisation request M/579.

NOTE 1 Initial self-discharge rate is not defined in the battery regulation but derived from "Evolution of self-discharging rates".

a) The battery passport should contain information on the evolution of self-discharge rates for stationary BESS using a BMS and LMT batteries.

b) The information on initial self-discharge rate should relate to the battery model.[13]

NOTE 2 The initial self-discharge rate is a battery model characteristic, while the evolution of self-discharge was named in the BattReg as data attribute on item-level.

c) The information on initial self-discharge rate should be accessible for persons with a legitimate interest.

d) The unit should be %/month.

6.7.4.7 Current self-discharge rate

The current self-discharge rate is the change of the self-discharge rate in an idle state of the battery in reference conditions (temperature etc.) at aging parameter x, e.g. after a certain amount of storage time or, number of cycles.

NOTE 1 Current self-discharge rate is not defined in the battery regulation but derived from "Evolution of self-discharging rates".

a) The battery passport should contain information on the evolution of self-discharge rates for stationary BESS using a BMS and LMT batteries.

b) The information on current self-discharge should relate to the battery item.

c) The information on current self-discharge should be accessible for persons with a legitimate interest.

d) The information on current self-discharge rate should be dynamic.

NOTE 2 An update interval for the current self-discharge rate upon change of battery status should be specified and be aligned with the update interval of the evolution of self-discharge rates (see 6.7.4.7).

e) The unit should be % per month.

6.7.4.8 Evolution of self-discharge rates

"Evolution of self-discharge rates" is the change of self-discharge over time and usage, as percentage calculated from the initial and current self-discharge rate.

a) The battery passport must contain information on the evolution of self-discharge rates for stationary BESS and LMT batteries.

NOTE 1 The BattReg lists evolution of self-discharge as mandatory data attribute on battery item level. This requirement is amended by voluntarily providing initial and current self-discharge rates (see 6.7.4.6 and 6.7.4.7).

NOTE 2 The battery regulation requires this information also for the category of LMT batteries using a BMS, whereas the standardization request M/579 does not address the data attribute for this battery category.

b) The information must relate to the battery item.

13 The BattReg lists evolution of self-discharge on battery item level, but the distinction of initial and current self-discharge rates renders this characteristic for the initial self-discharge rate to battery model level.

c) The information must be accessible for persons with a legitimate interest.

d) The information on evolution of self-discharge rates shall be dynamic.

e) The unit should be %.

f) The evolution of self-discharging rates should be calculated from the initial and current self-discharge rate.

g) The update interval for evolution of self-discharge rates should be upon placement on market and change of battery status.

NOTE 3 The definition of the mandatory update interval for evolution of self-discharge rates should be chosen in alignment with the current self-discharge rate (see 6.7.4.7).

NOTE 4 The evolution of self-discharge rates typically starts with 0 % at begin of life.

6.7.5 Internal resistance

6.7.5.1 Overview

Table 13 shows the data attributes regarding internal resistance and electrochemical impedance.

Table 13 — Data attributes regarding internal resistance and electrochemical impedance

Clause	Data attribute	BattReg reference	Data access[a]	Mandatory (M)/ Recommended (R)	Data type [Unit]	Static/ Dynamic[b]	Information level
6.7.5.2	Initial internal resistance of battery cell and pack (module recommended)[c]	Annex XIII (1o) Annex IV, Part A(3) Annex VII, Part A(5) (“where possible, the ohmic resistance”)	Public	M (cell and pack level) R for module level	Integer [Ω]	S	Model
6.7.5.3	Internal resistance increase of pack (cell and module recommended)	Annex IV, Part A(3) Annex VII, Part A(5) (“where possible, the ohmic resistance”)	PLI	M (pack level) R for cell/module level	Integer [%]	S	Model

NOTE Test methods and reference conditions and specifications are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

[a] Access is derived from the respective wording of the Battery Regulation or categorised analogously to similar parameters, if added by the consortium. Abbreviation: PLI = Persons with legitimate interest.

[b] Abbreviations: S = Static, D = Dynamic.

[c] This data attribute forms part of the state of health combination of parameters for LMT and stationary battery energy storage systems (stationary BESS).

6.7.5.2 Initial internal resistance of battery cell and pack (module recommended)

The internal resistance is "a quotient of change of voltage of a battery by the corresponding change in discharge current under specified conditions" (IEV 482-03-36).

a) BattReg Annex IV (5) states that 'Internal resistance' means the opposition to the flow of current within a cell or a battery under reference conditions, that is, the sum of electronic resistance and ionic resistance to the contribution to total effective resistance including inductive/capacitive properties. This definition differs from the definition according to the IEC Electropedia stated above.The battery passport must include information about the internal resistance.

b) The battery passport must include information about the internal resistance on both battery cell and pack level.

NOTE 1 In a separate instance, information on the ohmic resistance is required, where possible (BattReg Annex IV, Part A(3)). However, BattReg Annex XIII (1o) states that the battery passport is required to include information about the internal battery cell and pack resistance.

c) The unit of internal resistance must be Ohm [Ω].

NOTE 2 Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

d) The information on initial internal resistance of cell and pack must relate to the battery and cell model, respectively.

e) The information must be accessible to the public.

f) The battery passport can include additional information about the initial internal resistance on battery module level, if available. It should be defined and calculated analogously as the requirements on battery pack level above.

6.7.5.3 Internal resistance increase of pack (cell and module recommended)

The internal resistance means the increase over time and upon usage of internal resistance in %.

a) The battery passport must include information about the internal resistance increase.

b) The unit must be %.

c) The internal resistance increase shall concern the battery pack level.

d) The information on internal resistance increase of the battery pack shall relate to the battery model.

e) The information must be accessible for persons with a legitimate interest.

f) The internal resistance increase must be updated upon change of the battery status, which is associated with a new placement on market and described in 6.1.3.7.

g) The internal resistance increase over time and upon usage should be defined based on the ratio of current and initial values as follows:

$$R_{\text{increase}}(x) = \left(\frac{R(x) - R_{\text{BOL}}}{R_{\text{BOL}}} \right) \times 100\,\%$$

where

x is the aging parameter (e.g. storage time, number of cycles, etc.;);

$R(x)$ is the internal resistance at the aging parameter x; and

R_{BOL} is the internal resistance at begin of life.

NOTE Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

h) The battery passport can include additional information about the internal resistance increase on battery cell and battery module level, if available. It should be defined and calculated analogously to the requirements on battery pack level above.

6.7.6 Battery lifetime

6.7.6.1 Overview

Table 14 shows the data attributes regarding battery lifetime.

Table 14 — Data attributes regarding battery lifetime

Clause	Data attribute	BattReg reference	Data access[a]	Mandatory (M)/ Recommended (R)	Data type [Unit]	Static/ Dynamic[b]	Information level
6.7.6.2	Expected lifetime in calendar years	Annex IV, Part A(5)	PLI	M	Decimal [years]	S	Model
6.7.6.3	Expected lifetime: Number of charge-discharge cycles	Annex XIII (1j) Annex IV, Part A(5)	Public	M	Integer [-]	S	Model
6.7.6.4	Number of full charging and discharging cycles	Annex XIII, (4d) Annex VII, Part B(5)	PLI	M	Integer [-]	D	Item
6.7.6.5	Cycle-life Reference test	Annex XIII (1j)	Public	M	String [-]	S	Model
6.7.6.6	C-rate of relevant cycle-life test	Annex XIII (1p)	Public	M	Decimal [A/Ah]	S	Model
6.7.6.7	Energy throughput	Annex VII, Part B(2)	PLI	M for stationary BESS and LMT batteries using a BMS	Decimal [kWh]	D	Item
6.7.6.8	Capacity throughput	Annex VII, Part B(3)	PLI	M for stationary BESS and LMT batteries using a BMS	Decimal [Ah]	D	Item
6.7.6.9	Capacity threshold for exhaustion	Annex XIII (1k)	Public	M for EV	Integer [%]	S	Model

NOTE None of the data attributes are intended for the label.

[a] Access is derived from the respective wording of the Battery Regulation or categorised analogously to similar parameters, if added by the consortium. Abbreviation: PLI = Persons with legitimate interest.

[b] Abbreviations: S = Static, D = Dynamic.

6.7.6.2 Expected lifetime in calendar years

This data attribute refers to “the expected life-time under the reference conditions for which they have been designed in terms of cycles, except for non-cycle applications, and calendar years.”

a) The battery passport must include information about the expected battery lifetime in calendar years.

b) The information on battery lifetime in years must relate to the battery model.

c) The information must be accessible to the public.

d) The update interval must be upon placement on the market and upon change of the battery status, which is described in 6.1.3.7.

e) The unit should be years.

NOTE Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

6.7.6.3 Expected lifetime: Number of charge-discharge cycles

This data attribute refers to “the expected life-time under the reference conditions for which they have been designed in terms of cycles, except for non-cycle applications, and calendar years.” (see BattReg Annex IV A(5)).

a) The battery passport must include information about the expected battery lifetime expressed in cycles, and reference test used, except for non-cycle applications.

NOTE 1 This definition combines aspects of two separately occurring definitions in the Battery Regulation (Annex XIII (1j) and Annex IV, Part A(5)), which are similar but not identical: The exception for non-cycle applications is not included in the Annex XIII provision.

b) This data attribute is dimensionless.

c) The information on expected lifetime as number of charge-discharge cycles must relate to the battery model.

d) The information must be accessible to the public.

e) The reference test must consider reference conditions for which the battery has been designed.

NOTE 2 The data attribute is defined by measurement conditions of the cycle-life test (see 6.7.6.5) such as the charge and discharge rates in terms of rated capacity, and the depth of discharge in the cycle-life test.

NOTE 3 Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

f) The exception for non-cycle applications that is not included in the BattReg Annex XIII provision should apply to this data attribute in general.

6.7.6.4 Number of full charging and discharging cycles

a) The battery passport must include information on the full number of charging and discharging cycles.

NOTE 1 This definition combines aspects of two separately occurring definitions in the Battery Regulation (Annex XIII (4d) and Annex VII, Part B(5)), which are similar but not identical. In addition, they apply to the full battery passport scope and to stationary BESS and LMT batteries, respectively (see also recommendation).

b) This data attribute is dimensionless.

c) The information on number of full charging and discharging cycles must relate to the battery item.

d) The information must be accessible to persons with a legitimate interest.

e) The information shall be dynamic.

NOTE 2 The mandatory required update interval for the number of full charging and discharging cycles is subject to further elaboration by the European Commission, potentially as part of a delegated act (see BattReg Article 77(2)).

f) The number of full charging and discharging cycles should be determined considering reference conditions.

g) The value for the number of full charging and discharging cycles should result from the aggregation of partial cycles occurring in the use phase.

NOTE 3 Batteries will be charged/discharged partially in practice.

NOTE 4 Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

h) The exception for non-cycle applications as mentioned in 6.7.6.3 should apply to this data attribute as well.

6.7.6.5 Cycle-life Reference test

This data attribute describes the reference test for “Expected lifetime: Number of charge-discharge cycles” (see 6.7.6.3).

a) The battery passport must include information about the expected battery lifetime expressed in cycles, and reference test used.

b) This data attribute is dimensionless.

c) The information on cycle-life reference test must relate to the battery model.

d) The information must be accessible to the public.

NOTE Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

e) The exception for non-cycle applications as mentioned in 6.7.6.3 should apply to this data attribute as well.

6.7.6.6 C-rate of relevant cycle-life test

This data attribute is a measurement parameter for “Expected lifetime: Number of charge-discharge cycles”: Applied charge and discharge rate in terms of rated capacity (C-rate) of relevant cycle-life reference test (see above).

a) The battery passport must include information about the C-rate of relevant cycle-life test.

b) The information on the C-rate of relevant cycle-life test must relate to the battery model.

c) The information must be accessible to the public.

d) The expected life-time of the battery under the reference conditions for which it has been designed must be documented in terms of cycles, except for non-cycle applications.

NOTE 1 This data attribute is in close context with the cycle-life reference test (see 6.7.6.5) and the data attributes on charge-discharge cycles (6.7.6.3, 6.7.6.4).

NOTE 2 Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

e) The unit should be A/Ah.

f) The C-rate should be provided separately for both the charge and discharge of the battery, if applicable.

g) The exception for non-cycle applications as mentioned in 6.7.6.3 should apply to this data attribute as well.

6.7.6.7 Energy throughput

Energy throughput means the overall sum of the energy throughput over the battery lifetime at a specific time during usage.

a) The battery passport must contain information on the energy throughput over the battery lifetime for stationary BESS and LMT batteries using a BMS.

b) The information on energy throughput must relate to a battery item.

c) The information must be accessible to persons with a legitimate interest.

d) The information shall be dynamic.

NOTE 1 The mandatory required update interval for energy throughput is subject to further elaboration by the European Commission, potentially as part of a delegated act (see BattReg Article 77(2)).

NOTE 2 Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

e) The unit should be kWh.

f) The data attribute should be reported as measured for further potential processing. In addition, the normalisation by capacity may add a further useful value that ensures comparability among battery sizes.

6.7.6.8 Capacity throughput

Capacity throughput means the overall sum of the capacity throughput over the battery lifetime at a specific time during usage.

a) The battery passport must contain information on the capacity throughput for stationary BESS and LMT batteries using a BMS.

b) The information on capacity throughput must relate to a battery item.

c) The information must be accessible to persons with a legitimate interest.

d) The information on capacity throughput shall be dynamic.

NOTE 1 The mandatory required update interval for capacity throughput is subject to further elaboration by the European Commission, potentially as part of a delegated act (see BattReg Article 77(2)).

NOTE 2 Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

e) The unit should be Ah.

f) The data attribute should be reported as measured for further potential processing. In addition, the normalisation by capacity may add a further useful value that ensures comparability among battery sizes.

6.7.6.9 Capacity threshold for exhaustion

a) The battery passport must include information about the capacity threshold for exhaustion, only for EV batteries.

b) The information on capacity threshold for exhaustion must relate to the battery model.

c) The information must be accessible to the public.

NOTE 1 Test methods and reference conditions are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

d) The capacity threshold for exhaustion should be defined as the percentage of SOCE (see 6.7.2.7), above which the battery is still considered operational as EV battery in its current life, as provided by the economic operator.

e) The unit should be %.

NOTE 2 This data attribute can serve as indicator for a necessary end of current life as EV and could be understood in the context of warranty.

6.7.7 Temperature conditions

6.7.7.1 Overview

Table 15 shows the data attributes regarding temperature conditions.

Table 15 — Data attributes regarding temperature conditions

Clause	Data attribute	BattReg reference	Data access[a]	Mandatory (M)/ Recommended (R)	Data type [Unit]	Static/ Dynamic[b]	Information level
6.7.7.2	Temperature information	Annex XIII (4d)	PLI	M	[°C]	D	Item
6.7.7.3	Temperature range idle state, lower boundary	Annex XIII (1l)	Public	M	Integer [°C]	S	Model
6.7.7.4	Temperature range idle state, upper boundary	Annex XIII (1l)	Public	M	Integer [°C]	S	Model
6.7.7.5	Time spent in extreme temperatures above boundary	Annex VII, Part B(4) (Annex XIII (4d))	PLI	M for stationary BESS and LMT batteries using a BMS	Decimal [min]	D	Item
6.7.7.6	Time spent in extreme temperatures below boundary	Annex VII, Part B(4) (Annex XIII (4d))	PLI	M for stationary BESS and LMT batteries using a BMS	Decimal [min]	D	Item
6.7.7.7	Time spent charging during extreme temperatures above boundary	Annex VII, Part B(4) (Annex XIII (4d))	PLI	M for stationary BESS and LMT batteries using a BMS	Decimal [min]	D	Item
6.7.7.8	Time spent charging during extreme temperatures below boundary	Annex VII, Part B(4)	PLI	M for stationary BESS and LMT batteries using a BMS	Decimal [min]	D	Item

NOTE 1 None of the data attributes are intended for the label.

NOTE 2 Test methods and reference conditions for all data points here are subject to the ongoing standardization process at CEN/CENELEC relating to standardization request M/579.

[a] Access is derived from the respective wording of the Battery Regulation or categorised analogously to similar parameters, if added by the consortium. Abbreviation: PLI = Persons with legitimate interest.

[b] Abbreviations: S = Static, D = Dynamic.

6.7.7.2 Temperature information

a) The battery passport must include periodically recorded information on the operating environmental conditions, including temperature.

b) The information on temperature must relate to the battery item.

c) The information on temperature must be accessible to persons with legitimate interest.

d) The information on temperature shall be dynamic.

NOTE 1 The mandatory required update interval for temperature information is subject to further elaboration by the European Commission, potentially as part of a delegated act (see BattReg Article 77(2)).

NOTE 2 Requirements on specific temperature information is described in 6.7.7.5 to 6.7.7.8.

e) The unit should be °C.

f) Additionally, histograms should be used for the time spent charging in extreme temperatures, to keep the implementation effort and storage size lean. That means dividing the entire range of temperature values into a series of intervals, including above and below threshold of extreme temperatures, and then accumulate the time spent in each interval.

Any temperature measurement on an in-use battery should be defined in more detail. Specifically, the location of temperature sensors will decide upon the merit of values provided in temperature data attributes and their applicability to the entire battery, which may encounter temperature gradients.

6.7.7.3 Temperature range idle state, lower boundary

The temperature refers to the lower boundary of the surrounding temperature range.

a) The battery passport must include information about the temperature range the battery can withstand when not in use and a reference test must be provided.

b) The information on temperature range idle state (lower boundary) must relate to the battery model.

c) The information must be accessible to the public.

NOTE 1 Temperature safety limits apply generally, including both idle state as well as usage and can vary with operating conditions such as current and for charge and discharge.

NOTE 2 Information requirements on temperature range idle state (upper boundary) are described in 6.7.7.4.

d) The unit should be °C.

6.7.7.4 Temperature range idle state, upper boundary

The temperature refers to the upper boundary of the surrounding temperature range.

a) The battery passport must include information about the temperature range the battery can withstand when not in use and a reference test must be provided.

b) The information on temperature range idle state (upper boundary) must relate to the battery model.

c) The information must be accessible to the public.

NOTE 1 Temperature safety limits apply generally, including both idle state as well as usage and can vary with operating conditions such as current and for charge and discharge.

NOTE 2 Information requirements on temperature range idle state (lower boundary) are described in 6.7.7.3.

d) The unit should be °C.

6.7.7.5 Time spent in extreme temperatures above boundary

The time spent in extreme temperatures is the aggregated time, in which temperatures above the upper boundary of the temperature range as defined in 6.7.7.4 are prevalent.

a) The battery passport must include information on the time spent in extreme temperatures for stationary BESS and LMT batteries using a BMS.

b) The information on time spent in extreme temperatures above boundary must relate to the battery item.

c) The information must be accessible only to persons with a legitimate interest.

d) The information shall be dynamic.

NOTE 1 The mandatory required update interval for time spent in extreme temperatures above boundary is subject to further elaboration by the European Commission, potentially as part of a delegated act (BattReg Article 77(2)).

NOTE 2 General temperature information is provided separately, including for EV batteries (see 6.7.7.2 and BattReg Annex XIII (4d))

e) The unit should be min.

6.7.7.6 Time spent in extreme temperatures below boundary

The time spent in extreme temperatures is the aggregated time, in which temperatures below the lower boundary of the temperature range as defined in 6.7.7.3 are prevalent.

a) The battery passport must include information on the time spent in extreme temperatures for stationary BESS and LMT batteries using a BMS.

b) The information on time spent in extreme temperatures below boundary must relate to the battery item.

c) The information must be accessible only to persons with a legitimate interest.

d) The information shall be dynamic.

NOTE The mandatory required update interval for time spent in extreme temperatures below boundary is subject to further elaboration by the European Commission, potentially as part of a delegated act (BattReg Article 77(2)).

e) The unit should be min.

6.7.7.7 Time spent charging during extreme temperatures above boundary

The time spent charging in extreme temperatures is the aggregated time, in which the battery is charged, while temperatures above the upper boundary of the temperature range as defined in 6.7.7.4 are prevalent.

a) The battery passport must include information on the time spent charging in extreme temperatures for stationary BESS and LMT batteries using a BMS.

b) The information on time spent charging during extreme temperatures above boundary must relate to the battery item.

c) The information must be accessible only to persons with a legitimate interest.

d) The information shall be dynamic.

NOTE The mandatory required update interval for time spent charging in extreme temperatures above boundary is subject to further elaboration by the European Commission, potentially as part of a delegated act (see BattReg Article 77(2)).

e) The unit should be min.

f) Additionally, histograms should be used for the time spent charging in extreme temperatures, to keep the implementation effort and storage size lean. That means dividing the entire range of temperature values into a series of intervals and then accumulate the time spent in each interval.

6.7.7.8 Time spent charging during extreme temperatures below boundary

The time spent charging in extreme temperatures is the aggregated time, in which the battery is charged, while temperatures below the lower boundary of the temperature range as defined in 6.7.7.3 are prevalent.

a) The battery passport must include information on the time spent charging in extreme temperatures for stationary BESS and LMT batteries using a BMS

b) The information on time spent charging during extreme temperatures below boundary must relate to the battery item.

c) The information must be accessible only to persons with a legitimate interest.

d) The information shall be dynamic.

NOTE The mandatory required update interval for the time spent charging in extreme temperatures below boundary is subject to further elaboration by the European Commission, potentially as part of a delegated act (see BattReg Article 77(2)).

e) The unit should be min.

6.7.8 Negative Events

6.7.8.1 Overview

Table 16 shows the data attributes regarding negative events.

Table 16 — Data attributes regarding negative events

Clause	Data attribute	BattReg reference	Data access[a]	Mandatory (M)/ Recommended (R)	Data type [Unit]	Static/ dynamic[b]	Information level
6.7.8.2	Number of deep discharge events	Annex VII, Part B(4)	PLI	M for LMT batteries and stationary BESS using a BMS R for all batteries[c]	Integer [-]	D	Item
6.7.8.3	Number of overcharge events	Added by consortium	PLI	R for all batteries[c]	Integer [-]	D	Item
6.7.8.4	Information on accidents	Annex XIII (4d)	PLI	M	Link to PDF [-]	D	Item

[a] Access is derived from the respective wording of the Battery Regulation or categorised analogously to similar parameters, if added by the consortium. Abbreviation: PLI = Persons with legitimate interest.

[b] Abbreviations: S = Static, D = Dynamic.

[c] Batteries within battery passport scope: Industrial (> 2 kWh), LMT and EV batteries; BESS: Battery energy storage systems.

6.7.8.2 Number of deep discharge events

The number of deep discharge events is the number of occasions, in which voltage has dropped below the lower operational limit as provided in the battery passport (6.7.2.9).

a) The battery passport must include information on the tracking of harmful events, such as the number of deep discharge events for stationary BESS and LMT batteries using a BMS.

b) The information on number of deep discharge events must relate to the battery item.

c) The information must be accessible only to persons with a legitimate interest.

d) The information shall be dynamic.

NOTE The mandatory required update interval for deep discharge events is subject to further elaboration by the European Commission, potentially as part of a delegated act (see BattReg Article 77(2)).

e) This data attribute should be dimensionless.

f) This information should be reported voluntarily also for other battery categories, i.e. EV or all industrial batteries with a BMS.

6.7.8.3 Number of overcharge events

The number of overcharge events is the number of occasions, in which voltage has increased above the upper operational limit as provided in the battery passport (6.7.2.10).

a) As a non-mandatory data attribute the battery passport should include information on the number of overcharge events.

b) This data attribute should be dimensionless.

c) The information on number of overcharge events should relate to the battery item in analogy to deep discharge events.

d) The information should be accessible only to persons with a legitimate interest.

e) The information should be dynamic.

f) The update interval for the number of overcharge events should be analogous to that of the number of deep discharge events.

6.7.8.4 Information on accidents

a) The battery passport must contain information and data resulting from its use such as accidents.

b) The information on accidents must relate to the battery item.

c) The information must be accessible only to persons with a legitimate interest.

d) The information shall be dynamic.

NOTE 1 The mandatory required update interval for information on accidents is subject to further elaboration by the European Commission, potentially as part of a delegated act (see BattReg Article 77(2)).

e) Identification of accidents can be based on measuring abrupt positive or negative acceleration above a corresponding absolute threshold value. An identified accident should be followed by an assessment of battery safety.

NOTE 2 In the absence of elaboration in the Battery Regulation, information on accidents will require further definition on the intended scope, recording process, definition, and interpretation of information on accidents, which could be applicable to respective applications of batteries.

f) Reporting of information on accidents should consider requirements of personal data protection legislation.

Annex A
(informative)

Data attribute longlist

Table A.1 — Data attribute longlist

Number	Data attribute	Data type [Unit]	Static (S)/ Dynamic (D)	Mandatory (M)/Recommendation (R)	Labeling data
6.1 Identifiers and product data					
6.1.2.1	Battery passport identifier	ID	S	R	—
6.1.2.2	Battery identifier	ID	S	M	X
6.1.2.3	Operator identifier and information	ID	S	R	—
6.1.2.4	Manufacturer identifier and information	ID	S	M	X
6.1.3.1	Manufacturing place	String	S	M	X
6.1.3.2	Manufacturing date	Date [YYYY-MM]	S	M	X
6.1.3.3	Date of putting the battery into service	Date [YYYY-MM]	S	M	X
6.1.3.4	Warranty period of the battery	Date [YYYY-MM]	S	M	—
6.1.3.5	Battery category	String	S	M	X
6.1.3.6	Battery mass	Decimal [kg]	S	M	X
6.1.3.7	Battery status	String	D	M	—
6.2 Symbols, labels and documentation of conformity					
6.2.2	Separate collection symbol	Graphic	S	M	X
6.2.3	Symbols for cadmium and lead	Graphic	S	M	X
6.2.4	Carbon footprint label	Graphic	S	M	X
6.2.5	Extinguishing agent	String	S	M	X
6.2.6	Meaning of labels and symbols	String	S	M	X
6.2.7	EU declaration of conformity	PDF	S	M	X
6.2.8	Results of test reports proving compliance	PDF	S	M	—
6.3 Battery carbon footprint					
6.3.2	Battery Carbon Footprint per Functional Unit	[kgCO2e/kWh]	S	M	X
6.3.3	Contribution of raw material acquisition and pre-processing lifecycle stage	[kgCO2e/kWh]	S	M	—
6.3.4	Contribution of main product production/manufacturing lifecycle stage	[kgCO2e/kWh]	S	M	—
6.3.5	Contribution of distribution lifecycle stage	[kgCO2e/kWh]	S	M	—
6.3.6	Contribution of end of life and recycling lifecycle stage	[kgCO2e/kWh]	S	M	—
6.3.7	Carbon footprint performance class	String	S	M	X

Table A.1 (*continued*)

Number	Data attribute	Data type [Unit]	Static (S)/ Dynamic (D)	Mandatory (M)/Recommendation (R)	Labeling data
6.3.8	Web link to public carbon footprint study	Link to PDF	S	M	—
6.3.9	General battery and manufacturer information	See 6.1 and 6.2	S	M	—
6.3.10	Absolute battery carbon footprint	[tCO2e]	S	R	—
6.4 Supply chain due diligence					
6.4.2	Information of due diligence report in the Battery Passport	PDF	S	M	—
6.4.3	Third-party assurances (e.g., certifications) of recognised schemes	—	S	R	—
6.4.4	Supply chain indices	—	S	R	—
6.5 Battery materials and composition					
6.5.2	Battery chemistry	String	S	M	X
6.5.3	Critical raw materials	String	S	M	X
6.5.4	Materials used in cathode, anode and electrolyte	String	S	M	—
6.5.5	Hazardous substances	String	S	M	X
6.5.6	Impact of substances on environment, human health, safety, persons	String	S	M	—
6.6 Circularity and resource efficiency					
6.6.1 Circularity information					
6.6.1.2	Dismantling information: Manuals for the removal and the disassembly of the battery pack	Link to PDF	S	M	—
6.6.1.3	Part numbers for components	URL	S	M	—
6.6.1.4	Information on sources of spare parts	Text/URL	S	M	—
6.6.1.5	Safety measures	Link to PDF	S	M	—
6.6.2 Recycled and renewable content					
6.6.2.2	Pre-consumer and post-consumer recycled cobalt, lithium, nickel, and lead share	%	S	M	—
6.6.2.3	Pre-consumer recycled nickel share	%	S	M	—
6.6.2.4	Pre-consumer recycled cobalt share	%	S	M	—
6.6.2.5	Pre-consumer recycled lithium share	%	S	M	—
6.6.2.6	Pre-consumer recycled lead share	%	S	M	—
6.6.2.7	Post-consumer recycled nickel share	%	S	M	—
6.6.2.8	Post-consumer recycled cobalt share	%	S	M	—
6.6.2.9	Post-consumer recycled lithium share	%	S	M	—
6.6.2.10	Post-consumer recycled lead share	%	S	M	—
6.6.2.11	Renewable content share	%	S	M	—
6.6.3 Information on role of end-users in waste prevention and information on battery collection, preparation for second life and on treatment at end of life					

Table A.1 (*continued*)

Number	Data attribute	Data type [Unit]	Static (S)/ Dynamic (D)	Mandatory (M)/Recommendation (R)	Labeling data
6.6.3.2	Information on the role of end-users in contributing to waste prevention	Link to PDF	S	M	—
6.6.3.3	Information on the role of end-users in contributing to the separate collection of waste batteries	Link to PDF	S	M	—
6.6.3.4	Information on battery collection, preparation for second life and on treatment at end of life	Link to PDF	S	M	—
6.7 Performance and durability					
6.7.2 Capacity, energy and voltage					
6.7.2.2	Rated capacity	Ah	S	M	X
6.7.2.3	Remaining capacity	Ah	D	M	—
6.7.2.4	Capacity fade	%	S	M	—
6.7.2.5	Certified usable battery energy	kWh	S	R	—
6.7.2.6	Remaining usable battery energy	kWh	D	R	—
6.7.2.7	State of certified energy (SOCE)	%	D	M	—
6.7.2.8	State of charge (SoC)	%	D	M	—
6.7.2.9	Minimum voltage	V	S	M	—
6.7.2.10	Maximum voltage	V	S	M	—
6.7.2.11	Nominal voltage	V	S	M	—
6.7.3 Power capability					
6.7.3.2	Original power capability	W	S	M	—
6.7.3.3	Remaining power capability	W	D	M	—
6.7.3.4	Power fade	%	S	M	—
6.7.3.5	Maximum permitted battery power	W	S	M	—
6.7.3.6	Ratio between nominal battery power and battery energy	W/Wh	S	R	—
6.7.4 Round trip energy efficiency and self-discharge					
6.7.4.2	Initial round trip energy efficiency	%	S	M	—
6.7.4.3	Round trip energy efficiency at 50 % of cycle-life	%	S	M	—
6.7.4.4	Remaining round trip energy efficiency	%	D	M	—
6.7.4.5	Energy round trip efficiency fade	%	S	M	—
6.7.4.6	Initial self-discharge rate	%/month	S	R	—
6.7.4.7	Current self-discharge rate	%/month	D	R	—
6.7.4.8	Evolution of self-discharge rates	%	D	M	—
6.7.5 Internal resistance					
6.7.5.2	Initial internal resistance of battery pack	Ω	S	M	—
6.7.5.2	Initial internal resistance of battery cell	Ω	S	M	—
6.7.5.2	Initial internal resistance of battery module	Ω	S	R	—

Table A.1 (*continued*)

Number	Data attribute	Data type [Unit]	Static (S)/ Dynamic (D)	Mandatory (M)/Recommendation (R)	Labeling data
6.7.5.3	Internal resistance increase of battery pack	%	S	M	—
6.7.5.3	Internal resistance increase of battery cell	%	S	R	—
6.7.5.3	Internal resistance increase of battery module	%	S	R	—
6.7.6 Battery lifetime					
6.7.6.2	Expected lifetime in calendar years	Years	S	M	—
6.7.6.3	Expected lifetime: Number of charge-discharge cycles	—	S	M	—
6.7.6.4	Number of full charging and discharging cycles	—	D	M	—
6.7.6.5	Cycle-life Reference test	—	S	M	—
6.7.6.6	C-rate of relevant cycle-life test	A/Ah	S	M	—
6.7.6.7	Energy throughput	kWh	D	M	—
6.7.6.8	Capacity throughput	Ah	D	M	—
6.7.6.9	Capacity threshold for exhaustion	%	S	M	—
6.7.7 Temperature conditions					
6.7.7.2	Temperature information	°C	D	M	—
6.7.7.3	Temperature range idle state (lower boundary)	°C	S	M	—
6.7.7.4	Temperature range idle state (upper boundary)	°C	S	M	—
6.7.7.5	Time spent in extreme temperatures above boundary	min	D	M	—
6.7.7.6	Time spent in extreme temperatures below boundary	min	D	M	—
6.7.7.7	Time spent charging during extreme temperatures above boundary	min	D	M	—
6.7.7.8	Time spent charging during extreme temperatures below boundary	min	D	M	—
6.7.8 Negative Events					
6.7.8.2	Number of deep discharge events	—	D	M	—
6.7.8.3	Number of overcharge events	—	D	R	—
6.7.8.4	Information on accidents	—	D	M	—

Annex B
(informative)

Due diligence report

B.1 Obligations for economic operators on due diligence policies

BattReg Article 48(1) states that by 18 August 2025, economic operators placing batteries on the market must comply with:

— a management system (see BattReg Article 49);

— a risk management plan (see BattReg Article 50).

NOTE 1 Economic Operators may "for the purposes of compliance [...] collaborate with other actors, including through due diligence schemes recognized under this Regulation" (see Article 48 (4)). The recognition process will be introduced in implementing and delegated acts (see Article 53(1 and 3)).

BattReg Article 48(1) and Article 52 states that economic operators must disclose/keep three types of information/documentation on these obligations:

— documentation demonstrating compliance with the due diligence obligations to Member States' market surveillance or national authorities including:

  — a third-party verification report of the supply chain due diligence policies (see BattReg Article 48(2); 51);

  — an approval decision (see BattReg Article 52(1));

  — the audit reports of the notified body (see BattReg Article 52(1));

  — available evidence of compliance with a due diligence scheme recognised by the Commission (see BattReg Article 52(1));

— relevant information on due diligence policies to immediate downstream purchasers (see BattReg Article 52(2));

— a report on the two above mentioned obligations, a summary third-party verification report, and an elaboration on access to information, public participation in decision-making and access to justice to the public (including on the internet) (see BattReg Article 52(3)).

NOTE 2 Of those disclosures, only the information indicated under BattReg Article 52(3), the due diligence report, is stated in BattReg Annex XIII (1) as mandatory to be included in the battery passport.

NOTE 3 Upcoming additional information on these due diligence obligations will be twofold:

— BattReg Article 48(5) states that by 18 February 2025, the Commission must publish guidelines regards the application of the due diligence requirements.

— BattReg Article 48(6) states that Member States may set up websites, platforms or portals to provide information and support to economic operators on their obligations; the Commission may complement and support these.

B.2 Guidelines to align activities and reporting

The Battery Regulation specifies that the due diligence policy should incorporate internationally recognised standards listed in Annex X (3a), being:

— The International Bill of Human Rights, including the international covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights, International Bill of Human Rights | OHCHR;

— UN Guiding Principles for Businesses and Human Rights (UNGP), GuidingPrinciplesBusinessHR_EN.pdf (www.ohchr.org);

— OECD Guidelines for Multinational Enterprises, OECD Guidelines for Multinational Enterprises on Responsible Business Conduct | OECD;

— ILO Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy, Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy (MNE Declaration) | International Labour Organization (www.ilo.org);

— OECD Due Diligence Guidance for Responsible Business Conduct, Due diligence for responsible business conduct | OECD;

— OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas | OECD.

Annex C
(informative)

Recycled content targets

BattReg Article 8(2 and 3) states the mandatory recycled content targets for battery materials which are listed in Table C.1.

Table C.1 — Mandatory recycled content targets for battery materials in the EU Battery Regulation

Chemical element	Mandatory recycled content targets [per year/manufacturing plant]	
	18 August 2031	18 August 2036
Cobalt	16 %	26 %
Lead	85 %	85 %
Lithium	6 %	12 %
Nickel	6 %	15 %

Annex D
(informative)

References to Regulations

Data attributes for the battery passport which are mandatory according to BattReg or other regulations are indicated in Clause 5 and Clause 6 with the verbal expression "must". The references to the corresponding article in the BattReg or other regulations of the individual attributes is listed in Table D.1.

Table D.1 — References for data attributes and their requirements to the EU Battery Regulation and other regulation

Sub-clause	Subclause Title	Attribute	BattReg reference	Other regulation
5.2.1	Access to battery passport information	a)		
		b)	Article 3, 1(66) and Article 13 (6a)	
		c)	Article 77(3)	
		d)	Article 77(7)	
5.3	Labelling	a)	Article 13(1), Annex VI Part A	
		b)	Article 13(4)	
		c)	Article 13(5)	
		d)		
		e)	Article 13(6), Article 13(7)	
		f)	Article 13(7)	
6.1	Identifiers and product data			
6.1.2.2	Battery identifier	a)	Annex XIII (1a); Article 77(3); Article 3, 1(66)	ESPR, Annex III(b)
		b)	Article 38(6)	
		c)	Article 77(3)	ESPR, Annex III(c)
		d)	Article 77(3)	
		e)		
		f)	Annex XIII (1)	
6.1.2.3	Operator identifier and information	a)		
		b)		ESPR, Article 12(2)
		c)		
		d)		
		e)		ESPR, Article 12(1), Annex III
		f)		ESPR, Article 12(1), Annex III(c)

Table D.1 (*continued*)

Sub-clause	Subclause Title	Attribute	BattReg reference	Other regulation
6.1.2.4	Manufacturer identifier and information	a)	Annex XIII (1a)	
		b)	Annex VI, Part A(1); Article 38(7)	
		c)	Article 38(7)	
		d)	Article 38(7)	
		e)	Annex XIII (1)	
		f)	Annex XIII (1)	
		g)		ESPR Article 12(1), Annex III
		h)		ESPR Article 12(1), Annex III(c)
6.1.3.1	Manufacturing place	a)	Annex XIII (1a)	
		b)	Annex VI, Part A(3)	
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	
6.1.3.2	Manufacturing date	a)	Annex XIII (1a)	
		b)	Annex VI, Part A(4)	
		c)	Annex XIII (1a)	
		d)	Annex XIII (1a)	
		e)	Annex XIII (1a)	
6.1.3.3	Date of putting the battery into service	a)	Annex VII, Part B(1)	
		b)	Annex XIII (4)	
		c)	Annex XIII (4)	
6.1.3.4	Warranty period of the battery	a)	Annex XIII (1m)	
		b)	Annex XIII (1)	
		c)	Annex XIII (1)	
6.1.3.5	Battery category	a)	Annex XIII (1a)	
		b)	Annex VI, Part A(2)	
		c)	Article 3	
		d)	Annex XIII (1a)	
		e)	Annex XIII (1a)	
6.1.3.6	Battery mass	a)	Annex XIII (1a)	
		b)	Annex VI, Part A(5)	
		c)	Annex XIII (1a)	
		d)	Annex XIII (1a)	

Table D.1 (*continued*)

Sub-clause	Subclause Title	Attribute	BattReg reference	Other regulation
6.1.3.7	Battery status	a)	Annex XIII (4c)	
		b)	Annex XIII (4c)	
		c)	Annex XIII (4)	
		d)	Annex XIII (4)	
		e)	Article 77(7)	
6.2	Symbols, labels and documentation of conformity			
6.2.2	Separate collection symbol	a)	Annex XIII (1q)	
		b)	Article 13(4)	
		c)	Article 77(2)	
		d)	Article 77(2a), Annex XIII (1q)	
		e)	Article 13(4)	
		f)	Article 13(4)	
		g)	Article 13(4)	
6.2.3	Symbols for cadmium and lead	a)	Article 74(1e)	
		b)	Article 13(5)	
		c)	Article 13(5)	
		d)	Article 77(2)	
		e)	Article 74(1), points (a) to (f), Annex XIII (1s)	
		f)	Article 13(5)	
6.2.4	Carbon footprint label	a)	Article 7(2)	
6.2.5	Extinguishing agent	a)	Annex XIII (1a)	
		b)	Annex VI, Part A(9)	
		c)	Article 77(2)	
		d)	Annex XIII (1)	
6.2.6	Meaning of labels and symbols	a)	Article 74(1e)	
		b)		
		c)	Article 74(1), points (a) to (f), Annex XIII (1s)	
		d)	Article 74(1), points (a) to (f), Annex XIII (1s)	
		e)	Article 74	
6.2.7	EU declaration of conformity	a)	Annex XIII (1r)	
		b)	Article 77(2)	
		c)	Article 18	
6.2.8	Results of test reports proving compliance	a)		
		b)	Article 77(2)	
		c)	Annex XIII (3)	
6.3	Battery carbon footprint			

Table D.1 (*continued*)

Sub-clause	Subclause Title	Attribute	BattReg reference	Other regulation
6.3.2	Battery carbon footprint per Functional Unit	a)	Annex XIII (1c)	
		b)	Article 7 (1d)	
		c)	Article 7 (1)	
		d)	Annex XIII	
		e)		
		f)	Article 7 (1)	
6.3.3	Contribution of raw material acquisition and pre-processing lifecycle stage	a)	Article 7 (1e) and Annex II (4)	
6.3.4	Contribution of main product production/manufacturing lifecycle stage	a)	Article 7 (1e) and Annex II (4)	
6.3.5	Contribution of distribution lifecycle stage	a)	Article 7 (1e) and Annex II (4)	
6.3.6	Contribution of end of life and recycling lifecycle stage	a)	Article 7 (1e) and Annex II (4)	
6.3.7	Carbon footprint performance class	a)	Annex XIII (1c) and Article 7 (2)	
		b)		
		c)		
		d)	Article 7(2)	
		e)	Annex XIII	
6.3.8	Web link to public carbon footprint study	a)		
		b)	Article 7(1)	
		c)	Annex XIII	
6.4	Supply chain due diligence			
6.4.1	Overview	a)		GerSCA, Section 10
		b)		GerSCA, Section 10
6.4.2	Information of due diligence report in the Battery Passport	a)	Annex XIII (1d)	
		b)	Article 52(3); Annex XIII (1)	GerSCA, Section 10; EU CSDDD
		c)	Article 52(3)	
		d)		
		e)	Article 77(5)	
6.4.3	Third-party assurances of recognised schemes	a)	Article 53	
6.5	Battery materials and composition			
6.5.2	Battery chemistry	a)	Annex XIII (1b)	
		b)		
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	

Table D.1 (*continued*)

Sub-clause	Subclause Title	Attribute	BattReg reference	Other regulation
6.5.3	Critical raw materials	a)	Annex XIII (1b)	
		b)		
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	
		e)	Annex XIII (1b), Annex VI, Part A(10)	
6.5.4	Materials used in cathode, anode and electrolyte	a)	Annex XIII (2a)	
		b)	Annex XIII (2a)	
		c)	Annex XIII (2)	
		d)	Annex XIII (2a)	
6.5.5	Hazardous substances	a)	Annex XIII (1b)	
		b)		
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	
		l)	Article 74(3)	
6.5.6	Impact of substances on environment, human health, safety, persons	a)	Article 74 (1f)	
		b)	Annex XIII (1)	
		c)	Annex XIII (1)	
6.6	Circularity and resource efficiency			
6.6.1.2	Dismantling information: Manuals for the removal and the disassembly of the battery pack	a)	Annex XIII (2c)	
		b)	Annex XIII (2)	
		c)	Annex XIII (2)	
		d)	Annex XIII (2c)	
6.6.1.3	Part numbers for components	a)	Annex XIII (2b)	
		b)	Annex XIII (2)	
		c)	Annex XIII (2)	
6.6.1.4	Information on sources of spare parts: Postal, email and website address	a)	Annex XIII (2b)	
		b)	Annex XIII (2)	
		c)	Annex XIII (2)	
6.6.1.5	Safety measures	a)	Annex XIII (2d)	
		b)	Annex XIII (2)	
		c)	Annex XIII (2)	
6.6.2.2	Pre-consumer and post-consumer recycled cobalt, lithium, nickel, and lead share	a)	Annex XIII (1e)	
		b)	Article 8 (1)	
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	

Table D.1 (*continued*)

Sub-clause	Subclause Title	Attribute	BattReg reference	Other regulation
6.6.2.11	Renewable content share	a)	Annex XIII (1f)	
		b)	Annex XIII (1)	
		c)	Annex XIII (1)	
6.6.3.2	Information on the role of end-users in contributing to waste prevention	a)	Annex XIII (1s), Article 74 (1a)	
		b)	Annex XIII (1)	
		c)	Annex XIII (1)	
		d)	Annex XIII (1s)	
6.6.3.3	Information on the role of end-users in contributing to the separate collection of waste batteries	a)	Article 74 (1b)	
		b)	Annex XIII (1)	
		c)	Annex XIII (1)	
6.6.3.4	Information on battery collection, preparation for second life and on treatment at end of life	a)	Article 74 (1c)	
		b)	Annex XIII (1)	
		c)	Annex XIII (1)	
6.7	Performance and durability			
6.7.2.2	Rated capacity	a)	Annex XIII (1g) and Annex IV, Part A(1)	
		b)	Annex IV, Part A(1)	
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	
6.7.2.3	Remaining capacity	a)	Annex XIII (4b); Annex VII, Part A(1)	
		b)		
		c)		
		d)	Annex XIII (4)	
6.7.2.4	Capacity fade	a)	Annex IV, Part A(1)	
		b)	Annex IV, Part A(1)	
		c)		standardization request M/579
		d)	Annex XIII (4)	
		e)	Annex XIII (4a)	
		f)	Annex XIII (4a)	
6.7.2.7	State of certified energy (SOCE)	a)	Annex VII, Part A; Annex XIII 4b	
		b)		
		c)	Annex XIII (4)	
		d)	Annex XIII (4)	

Table D.1 (*continued*)

Sub-clause	Subclause Title	Attribute	BattReg reference	Other regulation
6.7.2.8	State of charge (SoC)	a)	Annex XIII (4d)	
		b)		
		c)		
		d)	Annex XIII (4)	
		e)	Annex XIII (4)	
6.7.2.9	Minimum voltage	a)	Annex XIII (1h)	
		b)		
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	
6.7.2.10	Maximum voltage	a)	Annex XIII (1h)	
		b)		
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	
6.7.2.11	Nominal voltage	a)	Annex XIII (1h)	
		b)		
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	
6.7.3.2	Original power capability	a)	Annex XIII (1i)	
		b)	Annex IV, Part A(2)	
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	
		e)	Annex IV, Part B(4)	standardization request M/579
6.7.3.3	Remaining power capability	a)	Annex XIII (4b); Annex VII, Part A(2)	
		b)	Annex XIII (4)	
		c)	Annex XIII (4)	
6.7.3.4	Power fade	a)	Annex IV, Part A(2)	
		b)	Annex IV, Part A(2)	
		c)		standardization request M/579
		d)	Annex XIII (4)	
		e)	Annex XIII (4a)	
6.7.3.5	Maximum permitted battery power	a)	Annex XIII (1i)	
		b)	Annex XIII (1i)	
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	

Table D.1 (*continued*)

Sub-clause	Subclause Title	Attribute	BattReg reference	Other regulation
6.7.4.2	Initial round trip energy efficiency	a)	Annex XIII (1n)	
		b)		
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	
6.7.4.3	Round trip energy efficiency at 50 % of cyle life	a)	Annex XIII (1n)	
		b)	Annex XIII (1)	
		c)	Annex XIII (1)	
		d)	Annex XIII (1n)	
6.7.4.4	Remaining round trip energy efficiency	a)	Annex XIII (4b); Annex VII, Part A(3)	
		b)		
		c)	Annex XIII (4)	
		d)	Annex XIII (4)	
6.7.4.5	Energy round trip efficiency fade	a)	Annex IV, Part A(4)	
		b)	Annex IV, Part A(4)	
		c)		standardization request M/579
		d)	Annex XIII (4)	
		e)	Annex XIII (4a)	
6.7.4.8	Evolution of self-discharge rates	a)	Annex VII, Part A(4)	
		b)	Annex XIII (4)	
		c)	Annex XIII (4)	
6.7.5.2	Initial internal resistance of battery cell and pack (module recommended)	a)	Annex IV, Part A(3)	
		b)	Annex XIII (1o)	
		c)	Annex IV, Part A(3); Annex VII, Part A(5)	
		d)	Annex VII, Part A(5)	
		e)	Annex XIII (1)	
6.7.5.3	Internal resistance increase of pack (cell and module recommended)	a)	Annex IV, Part A(3)	
		b)	Annex IV, Part A(3)	
		c)		
		d)		standardization request M/579
		e)	Annex XIII (4)	
		f)	Annex XIII (4a)	
6.7.6.2	Expected lifetime in calendar years	a)	Annex IV, Part A(5)	
		b)	Annex XIII (1)	
		c)	Annex XIII (1)	
		d)	Annex XIII (4a)	

Table D.1 (*continued*)

Sub-clause	Subclause Title	Attribute	BattReg reference	Other regulation
6.7.6.3	Expected lifetime : Number of charge-discharge cycles	a)	Annex XIII (1j); Annex IV, Part A(5)	
		b)		
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	
		e)	Annex IV, Part A(5)	
6.7.6.4	Number of full charging and discharging cycles	a)	Annex XIII (4d); Annex VII, Part B(5)	
		b)		
		c)	Annex XIII (4)	
		d)	Annex XIII (4)	
6.7.6.5	Cycle-life Reference test	a)	Annex XIII (1j)	
		b)		
		c)	Annex XIII (1)	
		d)	Annex XIII (1)	
6.7.6.6	C-rate of relevant cycle-life test	a)	Annex XIII (1p)	
		b)	Annex XIII (1)	
		c)	Annex XIII (1)	
		d)	Annex IV, Part A(5)	
6.7.6.7	Energy throughput	a)	Annex VII, Part B(2)	
		b)	Annex XIII (4)	
		c)	Annex XIII (4)	
6.7.6.8	Capacity throughput	a)	Annex VII, Part B(3)	
		b)	Annex XIII (4)	
		c)	Annex XIII (4)	
6.7.6.9	Capacity threshold for exhaustion	a)	Annex XIII (1k)	
		b)	Annex XIII (1)	
		c)	Annex XIII (1)	
6.7.7.2	Temperature information	a)	Annex XIII (4d)	
		b)	Annex XIII (4)	
		c)	Annex XIII (4)	
6.7.7.3	Temperature range idle state, lower boudary	a)	Annex XIII (1l)	
		b)	Annex XIII (1)	
		c)	Annex XIII (1)	
6.7.7.4	Temperature range idle state, upper boundary	a)	Annex XIII (1l)	
		b)	Annex XIII (1)	
		c)	Annex XIII (1)	

Table D.1 (*continued*)

Sub-clause	Subclause Title	Attribute	BattReg reference	Other regulation
6.7.7.5	Time spent in extreme temperatures above boundary	a)	Annex VII, Part B(4)	
		b)	Annex XIII (4)	
		c)	Annex XIII (4)	
6.7.7.6	Time spent in extreme temperatures below boundary	a)	Annex VII, Part B(4)	
		b)	Annex XIII (4)	
		c)	Annex XIII (4)	
6.7.7.7	Time spent charging during extreme temperatures above boundary	a)	Annex VII, Part B(4)	
		b)	Annex XIII (4)	
		c)	Annex XIII (4)	
6.7.7.8	Time spent charging during extreme temperatures below boundary	a)	Annex VII, Part B(4)	
		b)	Annex XIII (4)	
		c)	Annex XIII (4)	
6.7.8.2	Number of deep discharge events	a)	Annex VII, Part B(4)	
		b)	Annex XIII (4)	
		c)	Annex XIII (4)	
6.7.8.4	Information on accidents	a)	Annex XIII (4d)	
		b)	Annex XIII (4)	
		c)	Annex XIII (4)	

Bibliography

DIN EN 2, *Classification of fires*

DIN EN 17615:2022-12, *Plastics — Environmental Aspects — Vocabulary; German version EN 17615:2022*

DIN EN IEC 60086-1 (VDE 0509-86-1), *Primary batteries — Part 1: General*

DIN EN IEC 60086-4 (VDE 0509-4), *Primary batteries — Part 4: Safety of lithium batteries*

DIN EN IEC 61406-1 (VDE 0810-406-1):2023-12, *Identification Link — Part 1: General requirements (IEC 61406-1:2022); German version EN IEC 61406-1:2022*

DIN EN 61960-3 (VDE 0510-3), *Secondary cells and batteries containing alkaline or other non-acid electrolytes — Secondary lithium cells and batteries for portable applications — Part 3: Prismatic and cylindrical lithium secondary cells, and batteries made from them*

DIN EN IEC 62619 (VDE 0510-39):2023-08, *Secondary cells and batteries containing alkaline or other non-acid electrolytes — Safety requirements for secondary lithium cells and batteries, for use in industrial applications (IEC 62619:2022); German version EN IEC 62619:2022*

DIN EN IEC 62902 (VDE 0510-902), *Secondary cells and batteries — Marking symbols for identification of their chemistry*

DIN EN ISO 14021:2021-10, *Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling) (ISO 14021:2016 + Amd 1:2021); German version EN ISO 14021:2016 + A1:2021*

DIN EN ISO 80000-4:2020-01, *Quantities and units — Part 4: Mechanics (ISO 80000-4:2019); German version EN ISO 80000-4:2019*

DIN ISO 8601-1:2020-12, *Date and time — Representations for information interchange — Part 1: Basic rules (ISO 8601-1:2019)*

ISO 12405-4:2018, *Electrically propelled road vehicles — Test specification for lithium-ion traction battery packs and systems — Part 4: Performance testing*

ISO 8601-2:2019, *Date and time — Representations for information interchange — Part 2: Extensions*

ISO/IEC 18004:2015, *Information technology — Automatic identification and data capture techniques — QR Code bar code symbology specification*

IEC 60050-393:2003, *International Electrotechnical Vocabulary — Part 393: Nuclear instrumentation: Physical phenomena and basic concepts*[14]

IEC 60050-482:2004, *International Electrotechnical Vocabulary — Part 482: Primary and secondary cells and batteries*

Commission Delegated Regulation (EU) 2022/670, *Commission Delegated Regulation (EU) 2022/670 of 2 February 2022 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the provision of EU-wide real-time traffic information services*

14 Withdrawn. Replaced by IEC 60050-395:2014.

Directive 2008/98/EC, *Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives*

Directive (EU) 2020/1828, *Directive (EU) 2020/1828 and Regulation (EU) 2023/1542 and repealing Directive 2009/125/EC Text with EEA relevance.*

Directive (EU) 2024/1760, *Directive (EU) 2024/1760 of the European Parliament and of the Council of 13 June 2024 on corporate sustainability due diligence and amending Directive (EU) 2019/1937 and Regulation (EU) 2023/2859*

Regulation (EU) No 168/2013, *Regulation (EU) No 168/2013 of the European Parliament and of the Council of 15 January 2013 on the approval and market surveillance of two- or three-wheel vehicles and quadricycles*

Regulation (EU) 2018/858, *Regulation (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, amending Regulations (EC) No 715/2007 and (EC) No 595/2009 and repealing Directive 2007/46/EC*

Regulation (EU) 2019/1020, *Regulation (EU) 2019/1020 of the European Parliament and of the Council of 20 June 2019 on market surveillance and compliance of products and amending Directive 2004/42/EC and Regulations (EC) No 765/2008 and (EU) No 305/2011*

Regulation (EU) 2024/1781, *Regulation (EU) 2024/1781 of the European Parliament and of the Council of 13 June 2024 establishing a framework for the setting of ecodesign requirements for sustainable products (ESPR), amending Directive (EU) 2020/1828 and Regulation (EU) 2023/1542 and repealing Directive 2009/125/EC*

Directive (EU) 2019/882, *Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019, the accessibility requirements for products and services*

Regulation (EC) No 765/2008, *Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and repealing Regulation (EEC) No 339/93*

Regulation (EC) No 1272/2008, *Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008, classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006*

REACH, *Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EEC and 2000/21/EC*

Regulation (EU) 2023/1542, *Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 concerning batteries and waste batteries, amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC*

The International Bill of Human Rights, including the international covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights, International Bill of Human Rights | OHCHR

UN Guiding Principles for Businesses and Human Rights (UNGP), GuidingPrinciplesBusinessHR_EN.pdf (www.ohchr.org)

OECD Guidelines for Multinational Enterprises, OECD Guidelines for Multinational Enterprises on Responsible Business Conduct | OECD

ILO Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy, Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy (MNE Declaration) | International Labour Organization (www.ilo.org)

OECD Due Diligence Guidance for Responsible Business Conduct, Due diligence for responsible business conduct | OECD

OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas | OECD

Battery Passport Content Guidance, Achieving compliance with the EU Battery Regulation and increasing sustainability and circularity, Version 1.1, December 2023 (available at: https://thebatterypass.eu/resources/)

Battery Passport Data Longlist (Availabe at: https://thebatterypass.eu/assets/images/content-guidance/pdf/2023_Battery_Passport_Data_Attributes.xlsx

GBA Rulebook (available at: https://www.globalbattery.org/media/publications/gba-rulebook-v1.5-master.pdf)

German Supply Chain Act (GerSCA), Act on Corporate Due Diligence Obligations for the Prevention of Human Rights Violations in Supply Chains (Lieferkettensorgfaltspflichtengesetz — LkSG)

UN GTR No 22, *In-vehicle Battery Durability for Electrified Vehicles*[15]

UN Manual of Tests and Criteria, seventh revised edition (available at: https://unece.org/fileadmin/DAM/trans/danger/publi/manual/Rev7/Manual_Rev7_E.pdf)

15 Available at: UN Economic Commission for Europe, Palais des Nations, CH-1211 Geneva 10, Switzerland.