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Coding regulations of lithium ion batteries

锂离子电池编码规则

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1 Scope

This Document specifies the coding rules for lithium-ion cells, lithium-ion modules, lithium-ion battery packs, lithium-ion battery clusters, and lithium-ion battery systems (hereinafter collectively referred to as lithium-ion batteries), including coding targets, coding structure, coding representation methods, and coding identifiers, etc.

This Document applies to the coding of consumer lithium-ion batteries, large-power lithium-ion batteries (excluding power lithium-ion batteries for automotive), small-power lithium-ion batteries, and energy storage lithium-ion batteries. Other types of batteries may be used as a reference.

2 Normative References

GB/T 1988

GB/T 12508

GB/T 18347

3 Terms and Definitions

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

3.1 Cell

A device that converts chemical energy into electrical energy and vice versa by the

movement of lithium ions between positive and negative electrodes and is designed to be rechargeable.

NOTE. This device includes electrodes, separators, electrolytes, containers, and terminals, etc.

3.2 Module

A group of batteries consisting of lithium-ion cells connected in series, parallel, or series-parallel, may or may not have protection devices [such as fuses or positive temperature coefficient (PTC)] and monitoring circuits.

3.3 Battery pack

An energy storage device consisting of one or more lithium-ion cells or lithium-ion modules electrically connected.

NOTE 1.It includes monitoring circuitry that provides information (e.g., cell voltage) to the battery system.

NOTE 2.It may include protective shielding provided by terminals or other interconnecting means.

3.4 Battery cluster

A battery assembly consisting of battery modules connected in series, parallel, or series-parallel.

3.5 Battery system

A system consisting of one or more lithium-ion cells, lithium-ion modules, lithium-ion battery clusters, or lithium-ion battery packs.

NOTE 1.It includes a battery management system that activates if overcharge, overcurrent, overdischarge, or overheating occur.

NOTE 2.Overdischarge shutdown is not mandatory if agreed upon by the battery manufacturer and user.

NOTE 3.It may also include cooling or heating devices, and some may even include charging and discharging modules and inverter modules, etc.

4 Coding Targets

This document primarily covers lithium-ion batteries for consumer, high-power (excluding power batteries for automotive), low-power, and energy storage applications as the coding targets.

a) Consumer lithium-ion batteries primarily refer to batteries used in mobile communication terminals, tablet computers, portable computers, wearable devices, and other applications;

b) High-power lithium-ion batteries primarily refer to batteries used in electric ships and electric aircraft, etc.;

c) Low-power lithium-ion batteries primarily refer to batteries used in electric bicycles, electric motorcycles (two-wheeled and three-wheeled), electric scooters, and electric self-balancing scooters, etc.;

5.1 Coding structure for conventional-sized lithium-ion batteries

The coding structure for conventional-sized lithium-ion batteries consists of two main parts.

the first part, a fixed coding segment; and the second part, a non-fixed identification code. A schematic diagram of the coding structure is shown in Figure 1; and a description of the coding structure is shown in Table 1.Thereof, the fixed code segment and the non-fixed identification code shall be separated by a dash (-). If the lithium-ion battery is derived from repurposing, the repurposing identification code shall be added between the fixed code segment and the non- fixed identification code.

d The production serial number refers to the serial number of the battery product produced on the designated production line by the enterprise on the day of production.

5.2.1 General

The coding range for small-sized lithium-ion batteries includes the coding for the small-sized lithium-ion battery body and the coding for the smallest packaging unit containing the small- sized lithium-ion battery. A correspondence between the coding for the small-sized lithium-ion battery body and the coding for the smallest packaging unit must be established and documented.

5.2.2 Coding structure for small-sized lithium-ion battery body

The coding structure for the small-sized lithium-ion battery body utilizes a simplified coding scheme customized by the enterprise. This shall include at least the coding of production serial number, preferably include the enterprise coding, and specifications, etc. This coding shall be associated with the coding for the smallest packaging unit and documented.

NOTE. Small-sized lithium-ion batteries generally refer to products with a maximum surface area of less than 10 cm2.

6.1.1 Enterprise coding

The enterprise coding consists of 4 digits and is customized by the enterprise and documented.

Characters shall be selected from Arabic numerals and uppercase English letters (excluding "I" and "O") and combined.

EXAMPLE. Enterprise coding for lithium-ion batteries. ABC5.

6.1.2 Coding of product type

The coding of product type consists of 1 digit and shall comply with the provisions of Table 1.

It shall be expressed in uppercase English letters. Except for cells, the codes for other product types are grouped according to their application in the consumer, high-power, small-power, and energy storage sectors, respectively, in order of module, battery pack, battery cluster and battery system, using a unified code.

6.1.3 Coding of battery type

The coding of battery type consists of 1 digit and shall comply with the provisions of Table 1.

It shall be expressed in uppercase English letters.

6.1.4 Coding of production date

The coding of production date consists of 3 digits, using uppercase English letters and Arabic numerals. The first digit represents the year, which shall comply with the provisions of Table A.1 in Appendix A (a 30-year cycle). The second digit represents the month, which shall comply with the provisions of Table A.2.The third digit represents the calendar day, which shall comply with the provisions of Table A.3.

EXAMPLE. The coding of production date for lithium-ion batteries produced on January 1, 2025, is F11.

6.1.5 Repurposing identification code

Lithium-ion batteries of different product types that involve repurposing or contain repurposing lithium-ion batteries shall be identified by the repurposing identification code "-R" ("-" is a separator). EXAMPLE.

A lithium iron phosphate cell produced by manufacturer ABC5 on January 1, 2025, has a battery code of ABC5CBF11-non-fixed identification code. If manufacturer ABC5 also engages in repurposing, or if an independent repurposing enterprise ABCD repurposes the battery on January 1, 2025, a repurposing identification code must be added to the cell. The code is ABC5CBF11-R-non-fixed identification code/ABCDCBF11-R-non-fixed identification code. If the cell is used in the energy storage field, the corresponding codes of module, battery cluster, and battery system are: ABC5HBF11-R-non-fixed identification