

ICS 29.220.99

CCS K 82



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 31241.4-2026

**Safety of lithium-ion cells and batteries used in electronic and
electrical equipment - Part 4: Toys**

电子电器用锂离子电池和电池组安全 第4部分：玩具

Issued on: March 31, 2026

Implemented on: April 1, 2027

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

1	Scope
4	Test conditions
4.5	Test Charge/Discharge Procedure
4.6	Type Testing
5	General safety requirements
5.3	Labeling and Warning Instructions
5.4	Safety-critical components
6	Battery electrical safety test
7	Environmental safety testing
7.1	Overview 7.2~

1 Scope

GB 31241.4-2026 is the Chinese national standard covering lithium batteries inside toys - the cell and pack protection, the charging, the resistance to the crushing, dropping and short-circuiting a child will inflict, and the enclosure that keeps the battery inaccessible. A mandatory standard, first edition of this part, in force from 1 April 2027. It was issued on 31 March 2026 and takes effect on 1 April 2027, as a first edition. The document is under the responsibility of the Ministry of Industry and Information Technology. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the safety requirements for lithium-ion batteries and battery packs used in toys and describes the corresponding test methods. This document applies to lithium-ion batteries and battery packs used in toys. Reference is provided for lithium-ion batteries and battery packs used in similar products for children and infants. use. This document does not apply to lithium-ion batteries and battery packs used in children's watches.

4 Test conditions

4.1 Applicability of the Test The tests specified in this document shall be conducted only when safety is involved. Unless otherwise specified, samples are not required to be usable after testing.

4.2 Environmental conditions of the experiment Unless otherwise specified, the test shall

generally be conducted under the following conditions.

- a) Temperature. $25^{\circ}\text{C}\pm 5^{\circ}\text{C}$;
- b) Relative humidity. $\leq 75\%$;
- c) Air pressure. $86\text{kPa}\sim 106\text{kPa}$.

4.3 Parameter Measurement Tolerance The accuracy of all control or measured values relative to the specified or actual values shall be within the following tolerance range.

- a) Voltage. $\pm 0.2\%$;
- b) Current. $\pm 1\%$;
- c) Temperature. $\pm 2^{\circ}\text{C}$;
- e) Capacity. $\pm 1\%$.

4.4 Temperature Measurement Method The surface temperature of the sample was measured using the thermocouple method. The temperature test point was selected as the most unfavorable temperature point as the basis for test judgment.

Note. Auxiliary methods, such as infrared devices, are allowed to be used to find the most unfavorable point.

4.5 Test Charge/Discharge Procedure

4.5.1 Test charging procedure The battery or battery pack is charged with a current of $0.2I_t$. When the terminal voltage of the battery or battery pack reaches the charging limit voltage (U_{cl}), it switches to constant voltage charging. Charge the battery until the charging current is less than or equal to $0.02I_t$, then stop charging. Before charging, the battery or battery pack should be discharged according to the test method specified in

4.5.2 and left to stand for 10 minutes.

4.5.2 Test Discharge Procedure The battery or battery pack is discharged at a constant current of $0.2I_t$ until the discharge termination voltage (U_{de}).

4.6 Type Testing

4.6.1 Sample Requirements Unless otherwise specified, the tested sample should be a representative sample of the product that the customer will accept, including small-batch pilot production samples or samples prepared for testing. Products delivered to customers. Lithium-ion batteries and battery packs for toys should not use recycled products. If the test requires the introduction of wires for testing or connection, the total resistance generated by the introduction of wires for testing or connection shall be less than $20\text{m}\Omega$.

Note. The temperature coefficient of resistivity of the conductor is less than $5\times 10^{-3}^{\circ}\text{C}^{-1}$,

such as constantan wire.

4.6.2 Sample Quantity Unless otherwise specified, three samples are required for each test item.

4.6.3 Sample volume test The actual capacity of a battery or battery pack should be greater than or equal to its rated capacity; otherwise, it cannot be used as a typical sample for type testing.

Note. Unless otherwise specified, the above requirements apply only to type testing. The battery or battery pack should be fully charged according to the charging procedure specified in 4.5.1, allowed to stand for 10 minutes, and then discharged according to the discharging procedure specified in 4.5.2. The capacity provided during the discharge of electricity is the actual capacity of the battery or battery pack. When it is believed that the ambient temperature affects the capacity test results and there is any objection, an ambient temperature of $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$ can be used as the benchmark. The capacity test will be re-conducted under the new conditions.

4.6.4 Sample Pretreatment Before conducting the tests specified in 4.6.5, the samples should be pretreated as follows:

a) Charge-discharge cycle. The battery or battery pack undergoes two complete charge-discharge cycles according to the charge-discharge procedure specified in 4.5. Let the charge and discharge cycles pause for 10 minutes between each cycle. Note

1.Capacity testing can be performed simultaneously during the charge-discharge cycle pretreatment (a). The smaller capacity value after two complete charge-discharge cycles is taken as the sample. capacity.

b) Electrostatic discharge. For the battery pack, after completing the pre-treatment of charge-discharge cycle a), fully charge according to the charging procedure specified in 4.5.1. In addition, a 4kV contact discharge test ($\pm 4\text{kV}$ each) should be performed on each output terminal of the battery pack according to GB/T 17626.2. 10 times) and 8kV air discharge test ($\pm 8\text{kV}$ 10 times each). Note

2.If a sample catches fire, explodes, or leaks during the electrostatic discharge test, it is considered to be non-compliant with the requirements of this document.

4.6.5 Type Test Items Unless otherwise stated, all tests specified in this document are type tests. Unless otherwise specified, the test shall be conducted only on products manufactured within the last 12 months. The type test items for batteries and battery packs are shown in Table

1.The "Sample Quantity (Number)" column in the table indicates the number of test samples and their numbers.

4.6.6 Test Criteria A test can only be considered (qualified) if all test samples pass the

tests.

4.7 Single Failure Condition When applying simulated faults or abnormal operating conditions, they should be applied sequentially, simulating one fault at a time. The direct cause of the failure is considered to be part of the simulated failure or abnormal operating conditions. When a single fault is set, this single fault includes the failure of any component. Reasonable and foreseeable failure conditions should be determined by examining the circuit board, circuit diagram, and component specifications, for example.

5 General safety requirements

5.1 General Safety The safety of batteries and battery packs should be considered from two application conditions.

- a) Normal conditions;
- b) Reasonably foreseeable misuse, abuse, and failure conditions.

5.2 Safe Operating Parameters To ensure the safe use of batteries and battery packs under different conditions, their safe operating conditions should be specified, including temperature range and voltage range. Parameters such as current range. Due to differences in battery material systems and structures, their safe operating parameter values may vary.

Note. Examples of battery operating ranges can be found in Appendix A of GB 31241-2022. Product safety is related to usage; for safe product use, please refer to GB/T 42729. Manufacturers should include at least the information listed in Table 2 in the specifications. The parameters of the battery pack should match the parameters of its internal component cells.

5.3 Labeling and Warning Instructions

5.3.1 Labeling Requirements The markings on batteries or battery packs should be clear and legible, and should not be confusing. When using Chinese characters, at least the following labels should be indicated.

- a) Product name and model.
- b) Rated capacity, rated energy, charging limit voltage, and nominal voltage.
- c) Positive and negative polarity (output terminal), using the words "positive" and "negative" and the symbols "+" and "-".
- e) Production plant.
- f) Production date, in the order of "year, month, day", separated by "-", ".", or "/". Acceptable examples are as follows: The production date is indicated using "April 10, 2027", but