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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 36276-2023

Lithium ion battery for electrical energy storage

电力储能用锂离子电池

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Standardization Administration of the PRC

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Foreword

This document was issued on 28 December 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 July 2024.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 36276-2023 is the product standard for the lithium-ion cells and modules used in grid energy storage, and it addresses a duty cycle unlike any other battery application. A vehicle battery is sized for range and cycled once a day; a grid storage battery is cycled hard, sometimes several times daily, for fifteen or twenty years, in an installation containing megawatt-hours of energy in one enclosure. That concentration is what makes the safety requirements central: thermal runaway in a single cell must not propagate, because in a container of cells the consequence is not a damaged product but a fire that cannot be extinguished. Durability matters just as much commercially, since the economics of a storage project rest entirely on how much capacity remains after ten years. This document specifies the requirements for appearance, dimensions and mass, electrical performance, environmental adaptability, durability and safety of lithium-ion batteries for electrical energy storage, and describes the corresponding test methods. Under CCS F19, it is written for cell and system manufacturers, for the developers and operators of storage projects, and for the certification bodies and grid operators approving them.

This document specifies the appearance, size and mass, electrical performance, environmental adaptability, durability performance, safety performance and other requirements of lithium-ion batteries for electric energy storage (referred to as "lithium-ion batteries"); describes the corresponding test methods; stipulates coding, normal working environment, inspection rules, marking, packaging, transportation and storage, etc.

This document applies to the design, manufacturing, testing, inspection, operation, maintenance, and overhaul of lithium-ion batteries for electrical energy storage.

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, for dated reference documents, only the version corresponding to the date applies to this document; for undated reference documents, the latest version (including all amendments) applies to this document.

GB/T 191 Packaging - Pictorial marking for handling of goods

GB/T 2828.1 Sampling procedures for inspection by attributes - Part1.Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

GB/T 4857 (all parts) Packaging - Transport packages

GB/T 5398 Test methods for large transport packages

GB/T 16471 Dimensional and weight constraints for transport package

DL/T 2528 Basic terminology of electric energy storage

3 Terms, definitions, symbols

3.1 Terms and definitions

The terms and definitions as defined in DL/T 2528, as well as the following terms and definitions, apply to this document.

3.1.1

Rated power charging-discharge cycles

Under specified conditions, when the battery is cyclically charged and discharged at

rated power, the guaranteed value of number of cycles when the charge-discharge energy attenuate to the rated charging-discharge energy.

3.1.2

Nominal voltage of battery

A voltage value which marks or identifies a type of battery.

3.1.3

Initialized charging

Under specified conditions, the process where the battery is discharged to the discharge cut-off condition and then charged to the charge cut-off condition.

3.1.4

Initialized discharging

Under specified conditions, the process where battery is charged to the charge cut-off condition and then discharged to the discharge cut-off condition.

3.1.5

Rate charge-discharge

The process of charge-discharge the battery at a power value higher than the rated power, under specified conditions.

4 Encoding

The coding rules for lithium-ion batteries for electric energy storage are as shown in Figure 1.

5 Technical requirements

5.1 Normal working environment

The normal working environment of the battery shall meet the following requirements.

a) Temperature. 5 °C ~ 45 °C.

b) There is no condensation on the live parts.

c) Altitude. Not greater than 2000 m; when it is greater than 2000 m, it meets the high-altitude performance requirements in this document.

d) The air does not contain sand, dust, conductive, corrosive, or explosive particles

and gases that may affect normal operation.

5.2 Appearance, size, mass

5.2.1 Battery cells

The appearance, size, mass of battery cells shall meet the following requirements.

a) The appearance is free of scratches, deformation and damage; the positive and negative poles are free of rust; the markings are correct and clear;

b) The absolute deviation of thickness shall not be greater than 2 mm; the relative deviation of other dimensions shall not be greater than 1.0%;

c) The relative mass deviation is not greater than 1.5%;

d) The volumetric energy density is not less than the nominal value of the volumetric energy density;

e) The mass energy density is not less than the nominal mass energy density.

5.2.2 Battery module

The appearance, size, mass of the battery module shall meet the following requirements.

a) The appearance is not deformed or damaged; the structure is complete; the nameplate and marking are correct and clear;

b) The absolute deviation of dimensions meets the requirements of Table 1;

c) The relative mass deviation is not greater than 1.5%;

d) The volumetric energy density is not less than the nominal value of the volumetric energy density;

e) The mass energy density is not less than the nominal mass energy density.

6 Test methods

6.1 Test conditions

6.1.1 Test environment

Unless otherwise specified, the test shall be conducted in an environment at a temperature of 15 °C to 40 °C, a relative humidity of <= 80%, an atmospheric pressure of 86 kPa to 106 kPa.

6.1.2 Test equipment