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

GB/T 46735.3-2025

**High-temperature secondary batteries - Part 3: Sodium-based
batteries - Performance requirements and tests**

高温蓄电池 第3部分：钠基蓄电池 性能要求和试验

(English Translation)

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Foreword

This document is in accordance with GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting is scheduled.

This document is Part 3 of GB/T 46735 "High-Temperature Storage Batteries". GB/T 46735 has already published the following parts.

---Part 1: General Requirements;

---Part 3: Performance requirements and testing for sodium-based batteries.

This document is modified to adopt IEC 62984-3:2020 "High-temperature batteries - Part 3: Performance requirements and tests for sodium-based batteries".

Compared with IEC 62984-3:2020, this document has undergone the following structural adjustments.

---The tables in the symbols and abbreviations (see Table 1 in IEC 62984-3:2020) have been removed. Tables 1 to 3 correspond to IEC 62984-3 and 62984-3 respectively.

Tables 2 to 4 in 62984-3:2020.

The technical differences between this document and IEC 62984-3:2020, and the reasons therefor, are as follows.

---IEC 62902 (see 7.2) has been replaced with the normatively referenced GB/T 44224 to adapt to my country's technical conditions.

The following editorial changes have been made to this document.

---The note regarding "Capacity and Energy Testing" has been removed. "When charging reaches the upper limit cutoff voltage instead of 100% SOC, the battery will..." Fully charged (see IEC 62984-3:2020, 6.4.1), high-temperature batteries (sodium-sulfur batteries and sodium-nickel chloride batteries) Under these conditions, the battery cannot be fully charged.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Electrical Equipment Industry Association.

This document is under the jurisdiction of the National Lead-acid Battery Standardization Technical Committee (SAC/TC69).

Introduction

With the rapid development of global energy structure transformation and large-scale application of renewable energy, high-temperature batteries, as a special type of environmentally adaptable battery, have become increasingly important.

High-performance energy storage technology has demonstrated significant advantages in areas such as grid frequency regulation, industrial backup power, off-grid energy storage, and special operating conditions. Its typical operating temperature...

The temperature range (typically 200°C~350°C) endows these batteries with high energy density, long cycle life, and excellent dynamic characteristics, but at the same time...

It also poses unique challenges to material stability, system safety, and operational reliability.

To standardize the research, development, production, and application of high-temperature battery technology, this document focuses on typical high-temperature battery systems such as sodium-based batteries.

This involves establishing a unified performance evaluation framework, safety technical requirements, and testing and verification methods. It also includes specifying the basic parameters and environmental suitability of battery systems.

This document provides technical benchmarks for all links in the industry chain, including

stress performance indicators, thermal management requirements, and failure mode protection measures, which helps to promote technological progress.

Step by step with the healthy development of the market.

GB/T 46735 "High Temperature Storage Batteries" is proposed to consist of three parts.

---Part 1: General Requirements. This section specifies requirements for mobile and/or stationary applications at high temperatures with a nominal voltage not exceeding 1500V.

General requirements, definitions and test methods for storage batteries.

---Part 2: Safety Requirements and Testing. The purpose is to specify requirements for mobile and/or stationary applications with a rated voltage not exceeding 1500V.

Safety requirements and testing procedures for high-temperature batteries.

---Part 3: Performance Requirements and Testing for Sodium-Based Batteries. The purpose is to specify the performance requirements and testing standards for mobile batteries with a rated voltage not exceeding 1500V.

Performance requirements and test methods for sodium-based high-temperature batteries used in stationary applications.

The purpose of this document is to unify technical specifications and safety requirements, and to clarify the definition of energy storage by establishing general technical requirements and performance testing standards.

This document outlines the design, production, and testing specifications for high-temperature environments to ensure that product quality and safety meet unified standards. It also addresses high-temperature environments.

The document sets forth specific requirements for key indicators of batteries, such as capacity decay, cycle life, and thermal stability, in order to improve the high-temperature performance and reliability of batteries.

This will drive companies to optimize battery materials and processes, and improve high-temperature cycle performance, thermal safety performance, and impedance performance. The formulation of this document can...

To promote the standardization and high-quality development of the industry, standards will guide technological upgrades and reduce competition from low-quality products, thus creating a favorable environment for the development of the new energy storage manufacturing industry.

Large-scale application provides technical support and helps build a modern energy system.

High-Temperature Batteries Part 3.

Sodium-based battery performance requirements and testing

1 Scope

This document specifies the performance requirements and testing procedures for sodium-based high-temperature batteries with a rated voltage not exceeding 1500V for mobile and/or stationary use.

Verification method.

Sodium-based batteries include sodium-sulfur batteries and sodium-nickel chloride batteries. Both are high-temperature batteries and both use sodium as a conductive solid.

Electrolyte. More information on sodium-based battery technology, chemistry, and structure can be found in Appendix A.

This document applies to sodium-based high-temperature batteries used in mobile and/or stationary applications with a rated voltage not exceeding 1500V.

This document does not apply to aviation batteries covered by IEC 60952 (all parts) and electric batteries covered by IEC 61982 (all parts).

Storage batteries for propulsion of road vehicles.

Note: High-temperature batteries are electrochemical systems where the lowest internal operating temperature of a single cell exceeds 100°C.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are listed below.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 44224 Symbols for the identification of chemical substances in secondary batteries and battery packs (GB/T 44224-2024, IEC 62902.

2019, MOD)

GB/T 46735.1-2025 High-Temperature Storage Batteries - Part 1: General Requirements (GB/T 46735.1-2025, IEC 62984-1) 2020, MOD) Note. There are no technical differences between the content referenced in GB/T 46735.1-2025 and the content referenced in IEC 62984-1:2020.