

ICS 27.180
CCS F19



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

GB/T 43540-2023

**Decommissioning technical requirements of lithium ion battery
for electrical energy storage**

电力储能用锂离子电池退役技术要求

Issued on: December 28, 2023

Implemented on: July 1, 2024

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

Table of Contents

Foreword	3
1 Scope	4
2 Normative References	4
3 Terms and Definitions	4
4 General Requirements	5
5 Technical Requirements for Decommissioning	5
6 Decommissioning Determination Method	7
Appendix A (informative) Lithium Ion Battery Status Quantities and Alarm Data Table	12
Appendix B (informative) Lithium Ion Battery Electrical Properties Data Record Table	14

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 43540-2023 answers the question of when a lithium ion battery working in an electrical energy storage station should be taken out of service. The general requirements say the decision rests on the stated decommissioning criteria together with the condition of the equipment as shown by operation, maintenance and overhaul records, judged as a whole rather than on one reading. The technical requirements are then grouped: appearance, where defects on a cell, module or cluster such as obvious deformation, cracking, leakage or an operated pressure relief device bear on continued use; safety; electrical properties; and economical efficiency, which asks whether what the string can still do is worth the cost of keeping it in service. The determination method sets out step by step how each of those is checked and judged, beginning with the inspection of the battery and its electrical connections. Informative annexes supply a battery status and alarm data table and a record table for the electrical property measurements, so the evidence behind a retirement decision is written down in a form another party can read. Kept too long, a degraded battery becomes a fire risk and a liability; retired too early, an asset with years left in it is scrapped. For station operators, asset owners, maintenance contractors and those handling batteries after they leave service.

This document specifies the decommissioning technical requirements of lithium ion battery for

electrical energy storage (referred to as "lithium ion battery"), including appearance, safety, electrical properties and economical efficiency, etc., and describes the corresponding decommissioning determination method.

This document applies to the determination of the decommissioning of lithium ion battery used

for electrical energy storage.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only

versions with a specified date are applicable to this document. In terms of references without a

specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 36276 Lithium Ion Battery for Electrical Energy Storage

GB/T 36548 Test Code for Electrochemical Energy Storage Station Connected to Power Grid

DL/T 2528 Basic Terminology of Electrical Energy Storage

3 Terms and Definitions

The terms and definitions defined in DL/T 2528 and the following are applicable to this document.

3.1 parameters of battery state

Parameter values that directly or indirectly reflect various states, such as. battery performance

and service life, etc.

3.2 family defect

A defect caused by common factors, such as. design, materials, and processes, etc. during the

production and manufacturing of lithium ion battery.

4 General Requirements

4.1 The decommissioning of lithium ion battery shall be based on the decommissioning requirements of the energy storage battery and the equipment status reflected in the operation

and maintenance and overhauling data to carry out a comprehensive determination of the battery's appearance, safety, electrical properties and economical efficiency, etc.

4.2 The decommissioning determination of lithium ion battery can be carried out through the

modes of data analysis, on-site inspection and tests, etc.

4.3 When lithium ion battery cannot meet the technical indicators of operation or safety requirements, and the cost of transformation or the economical efficiency of overhauling and

maintenance technology is unreasonable, it shall be decommissioned.

5 Technical Requirements for Decommissioning

5.1 Appearance

5.1.1 When lithium ion battery cells, modules and battery clusters have appearance defects that

may affect their use, such as. obvious deformation, cracking, liquid leakage, pressure relief valve damage, breakdown or flashover marks, etc., they shall be decommissioned.

5.1.2 When the electrical connections of lithium ion battery cells, modules and battery clusters

have appearance defects, such as. damage, corrosion, looseness and falling-off, and cannot be

repaired, they shall be decommissioned.

5.2 Safety

5.2.1 Safety incidents

5.2.1.1 When lithium ion battery manifests thermal runaway or thermal diffusion, and

expansion, liquid leakage, gas leakage, fire, explosion, breakdown or flashover occurs, it shall

be decommissioned.

5.2.1.2 When lithium ion battery is improperly operated during commissioning, overhauling, operation and maintenance, resulting in safety incidents, such as. over-charging, over-discharging, overloading and external short circuit, etc., and the safety evaluation shows that

the battery does not meet the requirements, it shall be decommissioned.

5.2.2 Potential safety hazards

5.2.2.1 If the lithium ion battery management system frequently displays alarm information on

battery status, such as. voltage, voltage range, current, temperature, temperature range, insulation resistance, and inter-cluster circulation, etc., and cannot be repaired after maintenance or overhauling, it shall be decommissioned.

5.2.2.2 If the status evaluation of lithium ion battery shows that it has deterioration trends, such

as. abnormal energy and accelerated attenuation, it shall be decommissioned.

5.2.3 Insulation performance

If the ratio of the insulation resistance between the positive electrode of the lithium ion battery

modules or battery clusters and the external exposed conductive part, or between the negative

electrode of the battery modules or battery clusters and the external exposed conductive part to

the nominal voltage is less than 1,000 Ω/V and cannot be repaired, the battery shall be decommissioned.

5.2.4 Combustible gases and smoke

If lithium ion battery releases smoke or flammable gases, the corresponding battery shall be

decommissioned.

5.2.5 Voltage resistance

In accordance with the provisions of GB/T 36276, the corresponding voltage shall be applied