

ICS 43.020
CCS T 09



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

GB/T 33598.3-2021

**Recovery of traction battery used in electric vehicle - Recycling
- Part 3: Specification for discharging**

车用动力电池回收利用 再生利用 第3部分：放电规范

Issued on: October 11, 2021

Implemented on: May 1, 2022

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

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Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020 "Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents".

This document is Part 3 of GB/T 33598. The following parts of GB/T 33598 have already been issued:

- Recovery of traction battery used in electric vehicle - Dismantling specification (GB/T 33598);
- Recovery of traction battery used in electric vehicle - Recycling - Part 2: Material recovery requirements (GB/T 33598.2);
- Recovery of traction battery used in electric vehicle - Recycling - Part 3: Specification for discharging (GB/T 33598.3).

Attention is drawn to the possibility that some of the content of this document may be the subject of patent rights. The issuing body of this document bears no responsibility for identifying such patent rights.

This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

This document is under the jurisdiction of the National Technical Committee of Auto Standardization (SAC/TC 114).

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Introduction

When the remaining capacity of a traction battery falls to 80 % of its nominal capacity it can no longer meet the requirements of an electric vehicle. Once the battery has been scrapped from the vehicle it still holds a high residual charge, and irregular discharging during recycling readily leads to safety and environmental accidents. Ensuring that retired traction batteries are discharged safely, cleanly and efficiently - while the personal safety and the property of the operator are protected - is therefore necessary.

Although discharging processes and methods differ, the methods used in China fall mainly into the external circuiting method and the soaking method. Which discharging method to use for a waste traction battery, what the discharging process is to satisfy, and how the cut-off condition is judged are the key technical questions of a discharging specification.

Because the recycling of traction batteries raises many technical questions and involves many parties with differing needs, GB/T 33598 "Recovery of traction battery used in electric vehicle - Recycling" is intended to consist of 4 parts:

- Part 1: Dismantling specification. Intended to standardize the operating requirements for dismantling waste traction batteries, so that the operation is safe, clean and efficient.
- Part 2: Material recovery requirements. Intended to guide recycling enterprises in the efficient recovery of valuable metal elements and in pollution control.
- Part 3: Specification for discharging. Intended to select an applicable discharging method and to improve discharging efficiency while safety is ensured.
- Part 4: Recovery and treatment report. Intended to establish the framework and the format of the report that supports traceability management of waste batteries, and to standardize the necessary clauses.

GB/T 33598.3 is of significance for the scientific, safe and environmentally sound discharging of traction batteries during recycling.

1 Scope

This document specifies the terms and definitions, the basic requirements, the selection of the discharging process and the discharging methods, the storage requirements and the environmental protection measures for the discharging stage of traction battery recovery

and recycling.

This document applies to the discharging process in the recycling of retired lithium-ion traction batteries used in vehicles.

2 Normative references

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

GB/T 8196 Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards · GB 8978 Integrated wastewater discharge standard · GB/T 11651 Code of practice for selection of personal protective equipment · GB 15630 Specifications for setting of fire safety signs · GB 16297 Integrated emission standard of air pollutants · GB 18918 Discharge standard of pollutants for municipal wastewater treatment plant · GB/T 19596 Terminology of electric vehicles · GB/T 23821 Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs · GB/T 29090 Method of sampling for battery scrap · GB/T 33598 Recovery of traction battery used in electric vehicle - Dismantling specification · GB/T 34014 Automotive traction battery coding rules · GB 38031 Electric vehicles traction battery safety requirements · GB 50140 Code for design of extinguisher distribution in buildings · WB/T 1061 Specification for waste battery recycling management

3 Terms and definitions

For the purposes of this document, the terms and definitions given in GB/T 19596 and GB 38031 and the following apply.

3.1 External circuiting discharging

A method of discharging a battery through an external circuit, such as dedicated discharging equipment, a discharging resistor or a conductive medium.

3.2 Soaking discharging

A method of discharging in which the battery as a whole is immersed in a solution having electrical conductivity.

4.1 General requirements

4.1.1 A discharging procedure or work instruction shall be drawn up on the basis of the comprehensive utilization technical documents provided by the manufacturing enterprise, and complete protective materials, equipment and facilities shall be provided.

4.1.2 A fire safety inspection system, an environmental protection inspection system and an inspection, repair and maintenance system for equipment and facilities shall be established, and the corresponding management documents shall be produced.

4.1.3 Before discharging, the discharging area and the equipment and facilities shall be inspected in full, so that the environment is safe and the equipment and facilities operate normally.

4.1.4 Before discharging, the state of the battery shall be inspected and tested, and a suitable discharging method shall be selected according to characteristic parameters of the retired lithium-ion traction battery such as safety, voltage and residual charge.

4.2 Site requirements

4.2.1 The working site shall be an enclosed or semi-enclosed workshop, rainproof, ventilated and well lit.

4.2.2 The working site shall be provided with fire-fighting facilities and equipment as required by GB 50140, and with fire safety signs as required by GB 15630.

4.2.3 Smoking and open flames are strictly forbidden at the working site, the storage of flammable and explosive materials is prohibited, and warning signs shall be set up.

4.2.4 The working site shall be divided into an independent discharging area, storage area and so on, with area markings; the floor shall be hardened, insulated, corrosion-proofed and leak-proofed.

4.2.5 Protection and safety passages shall be provided around the discharging area, and the working safety distances shall follow the requirements of GB/T 23821.

4.2.6 The discharging area or site of the soaking method shall be provided with an emergency collection pond for wastewater leakage.

4.3 Personnel requirements

4.3.1 Operators shall take part in training in regulated discharging, environmental operation, safe operation and emergency handling, and may take up their post only after passing the internal assessment of the enterprise.

4.3.2 Operators shall wear and use protective equipment as required by GB/T 11651 and shall take the necessary insulation protection measures; a person not wearing protective equipment shall not approach the working area.

4.3.3 The operators should be not fewer than 2 in number, shall be familiar with the operating procedure, shall work strictly in accordance with the discharging procedure or work instruction, and shall be capable of handling an emergency.