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

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**Primary batteries - Part 6: Guidance on environmental aspects
(English Translation)**

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1 Scope

This document gives the general principles of the environmental impact of primary batteries, and explains the environmental impact of primary batteries from the aspects of environmental requirements and recommendations, marking, battery disposal, environmental considerations, packaging and life cycle assessment.

This document applies to the environmental impact assessment of standardized primary batteries such as zinc-manganese dioxide batteries, zinc-air batteries, lithium primary batteries, zinc-silver oxide batteries and various special-shaped batteries in GB/T

8897.1-2021, GB/T 8897.2-2021 and GB/T 8897.3-2021.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB 5085.1-2007, Identification standards for hazardous wastes -- Identification for corrosivity

GB 5085.2-2007, Identification standards for hazardous wastes -- Screening test for acute

toxicity

GB 5085.3-2007, Identification standards for hazardous wastes -- Identification for extraction toxicity

GB 5085.4-2007, Identification standards for hazardous wastes -- Identification for ignitability

GB 5085.5-2007, Identification standards for hazardous wastes -- Identification for reactivity

GB 5085.6-2007, Identification standards for hazardous wastes -- Identification for toxic substance content

GB/T 8897.1-2021, Primary batteries -- Part 1.General

GB/T 8897.2-2021, Primary batteries -- Part 2.Physical and electrical specifications

GB/T 8897.3-2021, Primary batteries -- Part 3.Watch batteries

GB/T 20155-2018, Determination of mercury, cadmium and lead in battery

GB 24427-2021, Content limitation of mercury, cadmium and lead for zinc anode primary battery

ISO 14040, Environmental management -- Life cycle assessment -- Principles and framework

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

cadmium-free battery

Batteries with a cadmium content not exceeding 20 µg/g.

[Source. GB 24427-2021, 3.6]

3.2

input fraction

The total mass of scrap batteries entering the recycling stream.

3.3

life cycle

A series of successive stages in a product system, from the acquisition of raw materials from nature or natural resources to their final disposal.

[Source. GB/T 24040-2008, 3.1]

3.4

mercury-free battery

Button cells with a mercury content not exceeding 5 µg/g and other batteries with a mercury content not exceeding 1 µg/g.

[Source. GB 24427-2021, 3.5]

3.5

output fraction

The total mass of material resulting from the input fraction that is recycled without further processing.

NOTE: The materials are no longer waste or are being used for their original purpose or for another purpose (except energy recovery).

3.6

recycling

Processing of waste materials to achieve their original or other uses.

3.7

recycling efficiency

A percentage ratio calculated by dividing the mass of the output fraction during the cycle by the mass of the input fraction of the discarded battery.

3.8

toxicity

The relative ability of exogenous chemicals to cause damage after coming into contact with the body or entering susceptible parts of the body.

4.1 Overview

The process of predicting and judging the environmental impact of batteries is complex.

Attempting to address a particular environmental impact may affect one or all stages of the battery life cycle. Nevertheless, the environmental impact of batteries shall still be considered when developing battery standards. The provisions in the standard shall reflect generally accepted strategies for improving the environment, including pollution prevention and resource conservation.

4.2 Purpose of this document

The guidelines in this document reflect generally accepted environmental regulations or national laws and are not intended to represent an environmental improvement strategy for a specific region.

When technological innovations bring benefits to the environment, the environmental guidelines in battery standards shall be reviewed.

Overly conservative clauses in standards may hinder innovation and environmental improvement. To address such negative effects, it is advisable to consider revising the standards.

4.3 Selection of batteries

Whether or not the choice of electrochemical system is part of the battery design, the choice of electrochemical system will have an impact on the environment. Failure to meet the performance requirements required by the device and the appropriate electrochemical system shall be selected shall have an impact on the environment.

Reliable information and clear guidance shall help users make better product choices when purchasing batteries.

In some applications, rechargeable batteries may be more environmentally friendly than other batteries because they can be recharged and reused. In such cases, rechargeable batteries shall be considered. However, when selecting batteries, emphasis shall be placed on performance requirements, duty cycle, toxic or non-renewable materials contained in the battery, charging equipment, total energy consumed by charging the battery during its life cycle, and other factors to achieve the goal of protecting the environment and saving costs.

Rechargeable batteries or small lithium primary batteries are good for the environment when used in high-current products (such as electric toys) or when portable power is frequently used. In daily equipment with medium or low current requirements or infrequent use, alkaline zinc-manganese dioxide batteries are more environmentally friendly.

4.4 Recovery rate

Some laws and regulations clearly stipulate the battery recycling rate, that is, the percentage of the total mass of batteries recycled in a natural year to the annual average mass of batteries put on the market in the previous three years.

5.1 Overview

Corresponding battery standards or environmental management requirements have been established in foreign countries. Batteries placed on the market in these countries or regions shall comply with the latest relevant regulations, see Annex A for details.