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

GB/T 42323-2023

Water for lead acid storage battery

铅酸蓄电池用水

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Foreword

This document was issued on 17 March 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 October 2023.

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 42323-2023 covers the water that goes into a lead acid battery - the water used in preparing the plates and in the other stages of making and maintaining a cell. Requirements set out what that water has to be; the test methods clause, by far the longest part of the document, carries the determination behind each requirement and opens at sampling, where five litres are taken in a container first washed repeatedly with the water to be tested, since the container is the easiest way to spoil the sample before it is ever analysed. Inspection rules govern how a lot is judged and released, and a final clause deals with marking, packaging, transportation and storage, including the inspection certificate that has to be fixed where it can be seen on the storage container. Water is the cheapest thing in a battery and one of the most damaging when it is wrong: whatever is dissolved in it stays with the plates for the life of the cell, raising self-discharge and working on the grids, and the loss turns up as capacity missing months later rather than as a batch that fails on the day. Battery manufacturers, water suppliers, plant quality departments and battery maintenance operations are the users.

This document specifies the requirements, test methods, inspection rules, marking, packaging,

transportation and storage of water for lead acid storage batteries.

This document is applicable to water for lead acid storage batteries.

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 601 Chemical Reagent - Preparations of Standard Volumetric Solutions

GB/T 602 Chemical Reagent - Preparations of Standard Solutions for Impurity (ISO 6353-1:1982, NEQ)

GB/T 603 Chemical Reagent - Preparations of Reagent Solutions for Use in Test Methods (ISO

6353-1:1982, NEQ)

GB/T 9724 Chemical Reagent - General Rule for the Determination of pH (ISO 6353-1:1982,

NEQ)

GB/T 9740 Chemical Reagent - General Method for the Determination of Dry Residue after Evaporation (ISO 6353-1:1982, NEQ)

GB/T 11446.1 Electronic Grade Water

GB/T 23942 Chemical Reagent - General Rules for Inductively Coupled Plasma Atomic Emission Spectrometry

3 Terms and Definitions

The following terms and definitions are applicable to this document.

3.1 water for lead acid storage battery

Water for lead acid storage battery refers to water used for lead acid battery plate preparation,

electrolyte preparation, replacement (replenishment) of water lost in electrolyte due to charging

5 Test Methods

5.1 Sampling

5.1.1 In accordance with this document, carry out the test. 5 L of sample shall be taken.

5.1.2 Before sampling, use the water to be tested to repeatedly wash the container. During sampling, avoid contamination, and the sample shall be filled in a clean and airtight plastic or

glass container. If the test cannot be carried out in time, the sample shall be stored in a refrigerator at 4 °C.

5.2 Appearance

In a brightly lit room, visually inspect whether the color of the water surface of the sample is colorless and transparent.

5.3 Residue Content

5.3.1 Instruments

The instruments required for the test are as follows:

- a) Rotary evaporator, equipped with a 500 mL distillation bottle;
- b) Constant-temperature water bath;
- c) Evaporating dish: it can be made of platinum, quartz and borosilicate glass;
- d) Electric oven: the temperature can be controlled at 105 °C ± 2 °C;
- e) Analytical balance: with a division value of 0.1 mg.

5.3.2 Determination steps

5.3.2.1 Sample pre-concentration

Weigh-take 500 g (or measure-take 500 mL) of the sample; by separate times, add the sample

to the distillation bottle of the rotary evaporator; on a constant-temperature water bath, evaporate it under reduced pressure (avoid evaporation to dryness). When the sample is finally

evaporated to about 50 mL, stop heating.

5.3.2.2 Determination

Transfer the above-mentioned pre-concentrated sample to an evaporating dish with a

constant

mass at 105 °C ± 2 °C; use 5 g ~ 10 g (or 5 mL ~ 10 mL) of the pre-concentrated sample to

wash the distillation bottle for 2 ~ 3 times. Combine the washing solution and the pre-concentrated sample in the evaporating dish and conduct the determination in accordance with

GB/T 9740.

and conduct a blank test. After determining a certain number of samples, a standard sample

shall be analyzed, so as to monitor these interferences.

5.4.2.2 The samples shall be analyzed as soon as possible. The longer the storage time, the

larger the possibility of contamination. If immediate analysis is not possible, seal the sample bottle in a plastic bag and store it in a refrigerator at 4 °C.

5.4.2.3 During the arbitration of the determination of lead (Pb), antimony (Sb), arsenic (As), tin

(Sn), bismuth (Bi), copper (Cu), cadmium (Cd), zinc (Zn), selenium (Se), iron (Fe), cobalt (Co),

nickel (Ni), chromium (Cr) and manganese (Mn) contents, adopt the atomic absorption spectrophotometry.

5.4.3 Reagents and preparation methods for reagent solutions

5.4.3.1 Water for the blank

EW-I electronic grade water specified in GB/T 11446.1.

5.4.3.2 Nitric acid

$\rho = 1.42 \text{ g/mL}$, prepare with MOS grade and above nitric acid.

5.4.3.3 Hydrochloric acid

1 + 1 (volume fraction), prepare with MOS grade and above hydrochloric acid.

5.4.3.4 Standard solutions

The standard substances used are respectively: lead GBW(E)080537, antimony GBW(E)080545, arsenic GBW(E)080530, tin GBW(E)080546, bismuth GBW(E)080271, copper