NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 2423.55-2023

Environmental testing - Part 2: Test methods - Test Eh: Hammer tests

环境试验 第2部分：试验方法 试验Eh：锤击试验

Issued on: September 7, 2023 **Implemented on: April 1, 2024**

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

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Foreword

This document was issued on 7 September 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 April 2024.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

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 55 of GB/T 2423.The published parts of GB/T 2423 are listed in Annex NA.

This document replaces GB/T 2423.55-2006 "Environmental testing for electric and electronic products - Part 2.Test method - Test Eh. Hammer tests". Compared with GB/T 2423.55-2006, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

a) Changed the setting of test parameter values and the consideration of their continuity (see 4.1.2, Table 1 and Table 2 of this Edition);

b) Changed the terms and definitions, and centralized the terms of different types of comparable test devices to reflect standardization and uniformity (see Chapter 3 of this Edition; 3.1, 4.1 and 5.1 of Edition 2006);

c) Added the description of the installation requirements in the hammer test. "Care shall be taken to ensure that there is no obvious air gap between this layer of nylon and the support." (see 4.2.2 of this Edition; 3.3.2 of Edition 2006);

d) Changed the description of the striking element in the vertical drop hammer test device (see 7.1 of this Edition; 6.2 of Edition 2006);

e) Added further provisions and example descriptions of the surface and internal structure of the basic test device components (see Figure 1, Figure 2 and Figure E.1 of this Edition);

f) Changed the applicable scope of the basic test device components (see 6.1, Figure D.2 of this Edition; 5.1, Figure D.2 of Edition 2006);

g) Added more accurate instructions and annotations for the test device structure and parts in the pictures (see the figure notes in Annex A, Annex B and Annex E of this Edition).

This document identically adopts IEC 60068-2-75.2014 "Environmental testing -- Part 2-75.Tests -- Test Eh. Hammer tests".

The following minimal editorial changes were made to this document.

a) Added the informative appendix "Constituent documents of GB/T 2423" (see Annex NA).

Environmental testing - Part 2.Test methods - Test Eh.

Hammer tests

1 Scope

GB/T 2423.55-2023 covers Test Eh, the hammer test of the environmental testing series: three equivalent methods for striking a specimen at a specified severity level, each defined by the number of blows, the energy of a blow and the direction it is delivered from, used to judge how robust a product is. The clause on general principles sets out the severity levels and the test apparatus. Two normative annexes carry the detail that decides whether one laboratory's result means the same as another's - Annex A fixes the shape of the striking element, illustrated for elements of one joule and below, of two joules and of five joules, and Annex B covers the calibration of the spring hammer, beginning from the calibration principle. Those annexes are where the reproducibility of the method lives, because an impact is not defined by its energy alone: the same joule figure delivered through a

differently shaped tip, or by a hammer that has drifted out of calibration, is not the same test, and a result quoted between a supplier and a customer who never share a bench is worth only as much as the agreement on the tool that produced it. For test houses, and for engineers who have to demonstrate that equipment survives being struck.

This document describes three equivalent test methods for subjecting samples to striking under specified severity levels, including the number of striking, energy and direction of striking. It is used to assess the robustness of products in terms of electrical safety.

This document is applicable to tests with energy levels from 0.14 J to 50 J.

This document gives three suitable apparatuses for the tests. Annex C provides guidance in this regard.

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.

ISO 1052, Steels for general engineering purposes

NOTE. GB/T 3934-2003, Specification of gauges for general purpose screw threads (ISO 1502.1996, MOD)

ISO 2039-2, Plastics -- Determination of hardness -- Part 2.Rockwell hardness

NOTE. GB/T 3398.2-2008, Plastics -- Determination of hardness -- Part 2.Rockwell hardness

(ISO 2039-2.1987, IDT)

ISO 2041, Vibration and shock and condition monitoring -- Vocabulary

NOTE. GB/T 2298-2010, Mechanical vibration, shock and condition monitoring -- Vocabulary

(ISO 2041.2009, IDT)

ISO2768-1, General tolerances -- Part 1.Tolerances for linear and angular dimensions without individual tolerances indications

NOTE. GB/T 1804-2000, General tolerances -- Tolerances for linear and angular dimensions

without individual tolerance indications (ISO 2768-1.1989, IDT)

The calibration striking element is suspended by four ropes "h" at four suspension points located on a horizontal plane 2000 mm above the last stop position of the calibration striking element. The calibration striking element swings the contact point "k" of the striking pendulum. The dynamic contact point shall not move downward more than 1 mm relative to the static position. It can be adjusted by raising the position of the suspension point. The raised distance is equal to the distance between the dynamic and static contact points.

With the suspension adjusted, the axis of the calibrated striking element "g" shall remain horizontal and perpendicular to the striking surface of the pendulum "c" during striking.

When the calibration striking element is in the static position, the calibration device shall be set so that the head of the calibration striking element is exactly in contact with the contact point "k".

To obtain reliable results, the calibration device shall be securely fastened to a heavy support, such as a structural part of a building.

The height of fall can be conveniently measured at the center of gravity of the calibrated striking element using a liquid level consisting of two glass tubes "j" connected by a hose. One of the glass tubes is fixed and marked with a scale "1".

The calibrated striking element can be positioned with a thin wire "m". The calibrated striking element is released when the thin wire is cut.

To determine the scale for the calibration device, draw a circle on the dial, concentric with the bearing of the pendulum and with a radius that extends the circle to the pointer. When the pendulum is in its rest position with a slight block before being struck, the pointer position is marked as 0 J (see Figure B.6).

The mass of the calibration striking element is 250 g. A calibration striking energy of 1 J can be obtained using a height of fall of 408 mm +/- 1 mm.

The suspended calibrated striking element is struck against the spring contact point "k" at the lower end of the pendulum to obtain a 1 J point on the scale. After the striking,