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GB/T 4857.23-2021

Replacing GB/T 4857.23-2012

Packaging – Basic Tests for Transport Packages – Part 23: Vertical Random Vibration Test Method

包装 运输包装件基本试验 第 23 部分：垂直随机振动试验方法

(ISO 13355:2016, Packaging – Complete, Filled Transport Packages and Unit Loads – Vertical Random Vibration Test, MOD)

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Foreword

This document was drafted as per the rules specified in GB/T 1.1-2020 *Directives for Standardization – Part 1: Rules for the Structure and Drafting of Standardizing Documents*.

This Document is Part 23 of GB/T 4857. GB/T 4857 has published the following parts:

--- Packaging – Basic tests for transport packages – Part 1: Identification of parts when testing;

--- Packaging – Basic tests for transport packages – Part 2: Temperature and humidity conditioning;

--- Packaging – Basic tests for transport packages – Part 3: Stacking tests using static load;

--- Packaging – Basic tests for transport packages – Part 4: Compression and stacking tests using a compression tester;

--- Packaging –transport packages – fall test methods;

--- Packaging –transport packages – rolling test methods;

--- Packaging – Basic tests for transport packages – Part 7: Sinusoidal vibration test method at constant frequency;

--- Packaging – Basic tests for transport packages – Part 9: Water spray test;

--- Packaging – Basic tests for transport packages – Part 10: Sinusoidal vibration test method using a variable vibration frequency;

--- Packaging – Basic tests for transport packages – Part 11: Horizontal impact test methods;

--- Packaging –transport packages – Immersed water test method;

--- Packaging – Basic tests for transport packages – Part 13: Low air pressure test method;

--- Packaging –transport packages – Topping test method;

--- Packaging – Basic tests for transport packages – Part 15: Controlled horizontal impact test method;

--- Packaging – Basic tests for transport packages – Part 17: General rules for the compilation of performance test;

--- Packaging –transport packages – Information record of the flow test;

--- Packaging –transport packages – Crash test method;

--- Packaging –transport packages – Stability test method for unit loads;

--- Packaging – Basic tests for transport packages – Part 23: Vertical random vibration test method.

This Document replaced GB/T 4857.23-2012 *Packaging - Basic tests for transport packages - Part 23：Random vibration test method*. Compared with GB/T 4857.23-2012, this Document made the following technical changes as follows besides the structural adjustments and editorial modifications:

a) Change the scope of application and change random vibration into vertical random vibration (see Clause 1 of this Edition; Clause 1 of the 2012 Edition);

b) Delete equalization, σ drive signal clipping and closed loop in "Terms and Definitions" (see 3.1, 3.3, 3.4 of 2012 Edition);

c) Add 3 kinds of devices that can be equipped with the vibration table to limit the test sample state (see 5.1 of this Edition);

d) Change the frequency resolution from 2Hz to 1Hz (see 5.1 of this Edition; 5.2.3 of 2012 Edition);

e) Delete the closed-loop control system (see 5.2.1, 5.2.2 of 2012 Edition);

f) Change the statistical degrees of freedom [see 5.2c) of this Edition; 5.2.3 of 2012 edition];

g) Delete the choice of test intensity (see 6.5 of 2012 Edition);

h) Delete equipment calibration (see 6.6 of 2012 Edition);

i) Add the limit of horizontal vibration component (see 6.5.3 of this Edition);

j) Add the requirement of collecting power spectral density for testing (see 6.5.7 of this Edition);

k) Add the requirements for the acceleration root mean square value and power spectral density deviation (see 6.5.8 of this Edition);

l) Delete the requirements for samples to be placed in an unfixed way and fixed way on the vibration table (see 6.7.4 and 6.7.5 of 2012 Edition);

m) Delete the requirement to stop the test when the test sample has predetermined damage (see 6.7.7 of 2012 Edition);

n) Delete the requirement to increase the test intensity for shortening the test time (see 6.7.8 of 2012 edition).

This Document uses the redrafting method to modify and adopt ISO 13355:2016 *Packaging – Complete, filled transport packages and unit loads – Vertical random vibration test*.

Compared with ISO 13355:2016, this Document has the structural changes:

a) Add the Clause 3 “Terms and Definitions”.

b) Adjust the Clause 3 of ISO 13355:2016 into Clause 4 of this Document.

c) Adjust the Clause 4 of ISO 13355:2016 into Clause 5 of this Document; adjust 4.1 and 4.2 of ISO 13355:2016 into 5.1 and 5.2 of this Document, respectively.

d) Adjust “The installation of test sample on vibration bench shall comply with the provisions of 9.1.3.5 in GB/T 4857.17-2017” specified in Clause 4 of ISO 13355:2016 into 6.5.2 of this Document.

e) Adjust 5.1 of ISO 13355:2016 into 6.1 of this Document; adjust 5.2 of ISO 13355:2016 into 6.3 of this Document; and adjust Clause 6 of ISO 13355:2016 into 6.5 of this Document.

f) Add the Appendixes C and D.

The technical differences and causes between this Document and ISO 13355:2016 are as follows:

a) Regarding Normative References, this Document has made adjustments with technical differences to adapt to China’s technical conditions. The adjustments are reflected in Clause 2 Normative References. The specific adjustments are as follows:

- Add the quotation of GB/T 4122.5 (see Clause 3 of this Edition);
- Use GB/T 4857.1 that modifies and adopts the international standard to replace ISO 2006 (see 6.2 of this Edition);
- Use GB/T 4857.2 that modifies and adopts the international standard to replace ISO 2233 (see 6.3 of this Edition);
- Use GB/T 4857.3 that equivalently adopts the international standard to replace ISO 2234 (see 6.5.2 of this Edition);
- Add the quotation of GB/T 4857.17-2017 (6.5.2, 6.1 of this Edition);

b) Add the Clause 3 “Terms and Definitions”; give specific definitions on PSD and g

Packaging – Basic Tests for Transport Packages – Part 23: Vertical Random Vibration Test Method

1 Scope

This Document specifies the vertical random vibration test principles, test equipment, test procedures and test reports of transport packages.

This Document is applicable to the vertical random vibration test of transport packages or unit loads. It is used to evaluate the strength of the package during vertical vibration and the protection ability of the package to the contents. It can be used as a single test or as a part of a series of tests.

2 Normative References

The provisions in following documents become the provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

GB/T 4122.5 Packaging terms - Part 5: Inspection and test

GB/T 4857.1 Packaging - Basic tests for transport packages - Part 1: Identification of parts when testing (GB/T 4857.1-2019, ISO 2206:1987, MOD)

GB/T 4857.2 Packaging - Basic tests for transport packages - Part 2: Temperature and humidity conditioning (GB/T 4857.2-2005, ISO 2233:2000, MOD)

GB/T 4857.3 Packaging - Basic tests for transport packages - Part 3: Stacking test methods using a static load (GB/T 4857.3-2008, ISO 2234:2000, IDT)

GB/T 4857.17-2017 Packaging - Basic tests for transport packages - Part 17: General rules for the compilation of performance test (ISO 4180:2009, MOD)

3 Terms and Definitions

For the purposes of this Document, the terms and definitions given in GB/T 4122.5 and the following apply.

3.1 Power spectral density; PSD

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