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**Packaging - Basic test for transport packages - Part
11: Horizontal impact test methods**

包装 运输包装件基本试验 第 11 部分：水平冲击试验方法

(ISO 2244:2000, MOD)

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

1 Scope

This part of GB/T 4857 specifies the main performance requirements, test procedures, test report content of the test equipment, which is used when carrying out horizontal impact tests (horizontal, inclined, pendulum tests), on transport packages and unit cargo.

This part is applicable to assess the impact resistance of transport packages and unit cargoes, when subjected to a horizontal impact, AND the protection capability of the package for the contents. It can be used as a single test OR as a part of a series of tests for packages.

2 Normative references

The provisions in following documents become the provisions of this Part through reference in this Part of GB/T 4857. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Part; however, parties who reach an agreement based on this Part are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 4857.1 Packaging - Basic test for transport packages - Part 1: Identification of parts when testing

GB/T 4857.2 Packaging - Basic test for transport packages - Part 2: Temperature and humidity conditioning

GB/T 4857.17 Packaging - Basic test for transport packages - Part 17: General principles for the compilation of performance test schedules

GB/T 4857.18 Packaging - Basic test for transport packages - Part 18: Quantitative data for the compilation of performance test schedules

3 Test principle

Make the test sample collide with a baffle plate, which is perpendicular to the same speed direction, at a predetermined speed, in a predetermined state. It is also possible to place suitable obstacles, between the baffle surface and the

impact surface and edge of the test sample, to simulate the impact under special circumstances.

4 Test equipment

4.1 Horizontal impact testing machine

The horizontal impact testing machine is composed of steel rails, trolleys, baffles.

4.1.1 Steel rail

Two straight steel rails, which are fixed in parallel, on a horizontal plane.

4.1.2 Trolleys

4.1.2.1 There shall be a driving device. Meanwhile it can control the impact speed of the trolley.

4.1.2.2 There shall be a certain friction, between the platform of the trolley and the test sample, so that the test sample and the trolley have no relative movement, during the movement process from static to before the impact. However, during impact, the test sample shall be able to move freely, as relative to the trolley.

4.1.3 Baffle

4.1.3.1 The baffle shall be installed at one end of the rail. Its surface shall form an angle of $90^{\circ} \pm 1^{\circ}$, with the direction of movement of the trolley.

4.1.3.2 The impact surface of the baffle shall be flat. Its size shall be larger than the size of the impacted part of the test sample.

4.1.3.3 The impact surface of the baffle shall have sufficient hardness and strength. When the surface is subjected to a load of 160 kg/cm^2 , the deformation shall not be greater than 0.25 mm.

4.1.3.4 When necessary, an obstacle can be installed on the baffle, to perform a concentrated impact test, on a special part of the test sample.

4.1.3.5 The baffle structure frame shall enable the trolley to continue to travel a certain distance, under the baffle, after the test sample impacts the baffle, so as to ensure that the test sample impacts the baffle, before the trolley stops.

4.2 Inclined impact testing machine

The inclined impact testing machine is composed of steel rails, trolleys, baffles,

5 Impact test equipment

When necessary, the test instrument shall be installed on the trolley or platen. Measure and record the peak acceleration and impact rate.

6 Test procedure

6.1 Preparation of test samples

Prepare test samples, according to the requirements of GB/T 4857.17.

6.2 The number of each part of the test sample

Number each part of the test sample, according to the provisions of GB/T 4857.1.

6.3 Pretreatment of test samples

Select a condition, to carry out temperature and humidity pretreatment of the test sample, according to the provisions of GB/T 4857.2.

6.4 Temperature and humidity conditions during the test

The test shall be carried out, under the same temperature and humidity conditions as the pretreatment. If the pretreatment conditions are not reached, the test must be started, within 5 minutes, after the test sample leaves the pretreatment conditions.

6.5 Selection of test strength value

Select the test strength value, according to the provisions of GB/T4857.18.

6.6 Test procedure

6.6.1 Place the test sample on the trolley (horizontal impact tester and inclined impact tester) OR platen (pendulum impact tester), according to the predetermined state.

6.6.1.1 When using an inclined or horizontal impact testing machine to carry out the test, the impact surface or edge of the test sample shall be flush with the front edge of the trolley. When pendulum impact tester is used to carry out the test, in case the freely suspended platen is in the static state, the impact surface or edge of the test sample just touches the impact surface of the baffle.

6.6.1.2 When the test sample is subjected to surface impact, the angle between the impact surface and the impact surface of the baffle shall not be greater than

2°.

6.6.1.3 When performing edge impact on the test sample, the angle, α , between the impact edge and the impact surface of the baffle, shall not be greater than 2°. If the test sample is a parallelepiped, the error of the angle, β , BETWEEN one of the two surfaces, which constitute the edge, AND the impact surface of the baffle, shall not exceed $\pm 5^\circ$ or within $\pm 10\%$ of the predetermined angle (whichever is larger), as shown in Figure 3.

6.6.1.4 When the test sample is subjected to angular impact, the test sample shall impact the baffle. The error of the angle, β , BETWEEN any plane, which is adjacent to the test angle, AND the baffle, shall not exceed $\pm 5^\circ$ or within $\pm 10\%$ of the predetermined angle (whichever is larger), as shown in Figure 4.

6.6.2 When using a horizontal impact testing machine for testing, make the trolley move along the rail, at a predetermined speed, AND reach the required impact speed, when it reaches the impact surface of the baffle.

6.6.3 When using the inclined surface impact testing machine to carry out the test, lift the trolley along the inclined surface of the rail, to a corresponding height, where the required impact speed can be obtained. Then release it.

6.6.4 When using the pendulum impact testing machine to carry out the test, pull-open the platen, to increase the position. Release it, when the distance, between the platen and the impact surface of the baffle, can produce the required impact speed.

6.6.5 No matter what kind of testing machine is used for the test, the impact speed error shall be within $\pm 5\%$ of the predetermined impact speed.

6.6.6 After the test, check the damage of the packaging and contents, according to the relevant standards. Analyze the test results.

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