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MACHINERY INDUSTRY STANDARD
OF THE PEOPLE'S REPUBLIC OF CHINA

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**Basic environmental conditions and testing methods for
instruments transportation and storage in the transportation**

仪器仪表运输、运输贮存基本环境条件及试验方法

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Basic environmental conditions and testing methods for instruments transportation and storage in the transportation

1 Scope

This Standard specifies the basic environmental conditions, test methods, and inspection rules for the transportation and storage of instruments.

This Standard applies to instrument products with exit-factory packaging. For products with special storage and transportation requirements, they can be separately specified in their product standards.

2 Normative references

The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. At the time of publication, the editions indicated are valid. All standards are subject to revision. The parties who are using this Standard shall explore the possibility of using the latest version of the following standards.

GB/T 2423.4-1993, *Basic environmental testing procedures for electric and electronic products - Test Db: Damp heat, cyclic*

3 Basic environmental conditions

According to the requirements of the product standard, select the graded rated values in Table 1.

Not more than 1°C per minute.

4.2.3 Test

Conduct the test according to the provisions of 4.2.1 and 4.2.2. After the test, raise the temperature of the packaging to room temperature and remove it. Under normal working conditions for more than 24 h, the product performance should still meet the requirements of the product standards.

4.3 Damp heat test

4.3.1 Test conditions

According to the provisions of GB/T 2423.4.

4.3.2 Test cycle

The weekly period is 24 h. The test consists of 2 cycles.

4.3.3 Test

Conduct the test according to the provisions of 4.3.1 and 4.3.2. Remove the packaging after the test. Under normal working conditions for more than 24 h, the product performance should still meet the requirements of the product standards.

4.4 Collision test ¹

4.4.1 Installation

The installation method of direct installation or transitional structure should be adopted. The packaging should be fastened to the collision table with straps. The transition structure should have sufficient rigidity to avoid causing additional resonance.

4.4.2 Test conditions

Acceleration: $100 \text{ m/s}^2 \pm 10 \text{ m/s}^2$;

Corresponding pulse duration: $11 \text{ ms} \pm 2 \text{ ms}$;

Pulse repetition rate: 60 times/min~100 times/min;

Continuous impact frequency: $1000 \text{ times} \pm 10 \text{ times}$;

Pulse waveform: approximately half sine wave.

4.4.3 Test

¹ When the collision table does not meet the volume and weight requirements of the product, the corresponding test method can be adopted through negotiation between the manufacturer and the user (such as in vehicle simulation test).

Conduct the test according to the provisions of 4.4.1 and 4.4.2. After the test, the product performance should still meet the requirements of the product standard.

4.5 Drop test

4.5.1 Free fall

4.5.1.1 Test bench

The test bench should be a flat and hard cement or steel plate surface.

4.5.1.2 Test conditions

Drop height: 50 mm, 100 mm, 250 mm.

4.5.1.3 Falling method

The bottom of the packaging falls horizontally in a free fall manner.

4.5.1.4 Number of drops

4 times.

4.5.1.5 Test

Conduct the test according to the provisions of 4.5.1.1~4.5.1.4. After the test, the product performance should still meet the requirements of the product standards.

4.5.2 Inclined drop

4.5.2.1 Test bench

The test bench should be a flat and hard cement or steel plate surface.

4.5.2.2 Test conditions

When the length of the bottom edge is less than 500 mm, one edge should be close to the ground and the bottom angle should be 30°.

When the length of the bottom edge is greater than or equal to 500 mm, one edge should be close to the ground, and the maximum distance from the tilted bottom to the ground is 250 mm.

4.5.2.3 Falling method

According to 4.5.2.2, release and drop after the bottom surface is inclined.

4.5.2.4 Number of drops

Each standard edge on the bottom surface of the packaging shall be tested once in

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