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

GB/T 12106-2026

Replacing GB/T 12106-2017

**Requirements and methods of environmental testing for
electrophonic musical instruments**

电鸣乐器环境试验要求和试验方法

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document supersedes GB/T 12106-2017 "Environmental Testing Requirements and Test Methods for Electronic Keyboards" and is consistent with GB/T 12106-2017. Compared to previous versions, aside from structural adjustments and editorial changes, the main technical changes are as follows:

- a) The provisions of the General Provisions have been amended (see Chapter 4, Chapter 3 of the.2017 edition);
- b) Environmental testing requirements have been added (see Chapter 5);
- c) The high-temperature storage test method has been modified (see 6.1.2, 4.1.2 of the.2017 version);
- d) The low-temperature storage test method has been modified (see 6.1.5, 4.1.5 in the.2017 version);
- e) A thermal cycling test method has been added (see 6.1.6);
- f) The crash test method has been removed (see 4.2.2 in the.2017 version);
- g) A static pressure test method has been added (see 6.2.2);
- h) The free fall test method has been changed (see 6.2.3, 4.2.3 in the.2017 version). Please note that some content in this document may involve

patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed by the China National Light Industry Council. This document is under the jurisdiction of the National Technical Committee on Standardization of Musical Instruments (SAC/TC371). This document was drafted by: Deli Musical Instruments (Zhuhai) Co., Ltd., Hangzhou Aierke Musical Instruments Co., Ltd., and Yinfei Technology (Jiangsu) Co., Ltd. Deli Electronics (Shanghai) Co., Ltd., Beijing Light Industry Technician College (Beijing Musical Instrument Research Institute), Changsha Huanyin Technology Co., Ltd. The main drafters of this document are: Liu Guozong, Xie Qibin, Xu Ruixiang, Zhang Guowen, Tan Chiqiang, Jiang Feng, Qin Hongwei, Zhang Guangzhong, and Zhang Yiyi. Yu Yangtao, Ge Xinghua, Zhang Xin, Guo Ting, Han Yanfu, Jiang Wannian, Cao Qiang. The release history of this document and the document it replaces is as follows:

4 General Rules

4.1 Environmental testing is divided into climatic environmental testing and mechanical environmental testing.

4.2 After environmental testing, the test product shall meet the requirements specified in the relevant national or industry standards for electric musical instruments.

4.3 Test samples shall be randomly selected from products that have passed factory inspection. Test samples that have undergone environmental testing shall not be released as genuine products.

4.4 The test sequence shall be carried out in accordance with the arrangement of this standard.

4.5 All tests shall be performed on the same test specimen.

4.6 The pretreatment of the test specimen, the recovery of the test specimen after environmental testing, and the evaluation of the test results shall be in accordance with the provisions of GB/T 2421-2020. The experiment was conducted under normal atmospheric conditions.

4.7 When there is doubt about the evaluation of the test results and arbitration is required, the arbitration conditions shall comply with the provisions of Table 1.

4.8 When the original environmental conditions of the test sample do not meet the normal test conditions and have an impact on it, measures should be taken to remove or partially eliminate the pollutants produced. To mitigate the impact on life, a 48-hour pretreatment should be performed.

5 Environmental testing requirements

5.1 Climate and Environmental Testing The test results included high temperature load test, high temperature storage test, damp heat test, low temperature load test, low temperature

storage test, thermal cycling test, and salt spray test. Afterwards, the test sample should function normally and should not have obvious rust.

5.2 Mechanical Environment Testing

5.2.1 After the vibration test, the test specimen should be able to function normally.

5.2.2 After the static pressure test, the safety factor of the test specimen shall meet the requirements of Table 2.

5.2.3 The test sample shall function normally after the free drop test.

6.1 Climate and Environmental Testing

6.1.1 High Temperature Load Test Place the unpackaged test sample into a test chamber at a temperature of $(40\pm 2)^{\circ}\text{C}$, turn on the power supply to the test sample, and input an appropriate frequency signal or play a program. Play the demonstration piece, set the main volume control to provide 1/8 of the unclipping output power to the rated load from the test sample, and operate continuously for 2 hours. Then, [the test sample is then subjected to further testing]. The sample was inspected.

Note. The digital interface controller for electric musical instruments should be checked after 2 hours of continuous full-load operation.

6.1.2 High-temperature storage test The packaged test sample was placed in a test chamber at a temperature of $(55\pm 2)^{\circ}\text{C}$ for 24 hours. After removing the test sample and allowing it to recover for 2 hours, the sample was then subjected to further treatment. The sample was inspected.

6.1.3 Damp heat test The unpackaged test sample was placed in a test chamber at a temperature of $(40\pm 2)^{\circ}\text{C}$ and a relative humidity of $(93\pm 3)\%$ for 48 hours. Afterwards, the sample was subjected to further testing. The sample was inspected.

6.1.4 Low Temperature Load Test Place the unpackaged test sample into a test chamber at a temperature of $(0\pm 2)^{\circ}\text{C}$, turn on the power supply to the test sample, and input an appropriate frequency signal or play a video. The demonstration piece was set to allow the test sample to provide 1/8 of the unclipping output power to the rated load. After 1 hour of continuous operation, the test sample was removed. The test sample was examined 2 hours after recovery.

Note. The digital interface controller for electric musical instruments should be checked after 1 hour of continuous full-load operation.

6.1.5 Low-temperature storage test Place the packaged test specimen into a test chamber at a temperature of $(-25\pm 2)^{\circ}\text{C}$. (To prevent condensation, it is permissible to wrap the test specimen in plastic.) Seal the film (if necessary, place a desiccant inside the sealing sleeve) and keep for 24 hours. Remove the test sample, allow it to recover for 2 hours, and then

proceed with the test. examine.

6.1.6 Thermal Cycling Test Follow these steps.

- a) Place the unpackaged, unpowered test sample into a test chamber pre-adjusted to a low temperature $T1.-10^{\circ}\text{C}$, and leave it for $t1.1\text{h}$;
- b) Transfer the test sample from the test chamber to a test chamber pre-adjusted to a high temperature $T2.50^{\circ}\text{C}$, and place it for $t1.1\text{h}$;
- c) The conversion time conforms to the specification of $t2.2\text{min}\sim 3\text{min}$. Within the conversion time $t2$, the test sample is transferred to the low-temperature chamber for further processing. A loop;
- d) As shown in Figure 1, the loop count is 5 times;
- e) Remove the test sample and examine it.

6.1.7 Salt spray test Place the unpackaged complete machine or external metal parts into a salt spray test chamber conforming to GB/T 2423.17-2024, and the concentration of the salt solution... The concentration (mass fraction) should be $(5\pm 1)\%$, the temperature should be $(35\pm 2)^{\circ}\text{C}$, the pH should be between

6.2 Mechanical Environment Testing

6.2.1 Vibration Test Secure the unpackaged test specimen (in its non-operating state) in its normal operating position for vibration testing in accordance with GB/T 2423.10-2019. On the test platform, the center of gravity of the test specimen is placed in the central area of the test platform, and the test conditions are carried out sequentially in the vibration directions of the X, Y, and Z axes according to Table 3. Vibration tests under test conditions 1 and 2.

6.2.2 Static pressure test Place the packaged test specimens on the test bench of the packaging compression testing machine according to the stacking direction indicated on the packaging box. A static pressure strength test is carried out by applying a load F on the top, and the safety factor is calculated according to formula (1).

6.2.3 Free Fall Test

6.2.3.1 The test specimen, in its packaged state, shall undergo a free drop test in the order of face, edge, and corner. The test platform and the test specimen shall begin to fall. The position and status at that time shall comply with the requirements of GB/T 2423.7-2018.