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

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Replacing GB/T 11606.9-1989

Methods of environmental test for analytical instruments

分析仪器环境试验方法

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1 Scope

GB/T 11606-2007 is the Chinese national standard on methods of environmental test for analytical instruments, in the field of testing. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 10 November 2007 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 December 2007. Classification: ICS 19.040, CCS N50. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This standard specifies the general rules and methods of environmental test methods for analytical instruments. This standard applies to the selection of the environmental test of instruments, which are required in the process of the research, development, design, manufacture, sale, of all analytical instruments (hereinafter referred to as instrument), for the purposes of ensuring the product quality, as well as in the process of developing product standards.

2 General

2.1 Applicability This general rule applies to all instruments. It specifies the grouping of environmental condition, reference working conditions, test items, selection of grouping of environmental condition, test procedures, test sequence of the instrument.

2.2 Grouping of environmental condition The instruments are divided into the following 4 basic groups, according to the conditions of use and transportation and circulation (see Table 1 for details): Group I: The ambient temperature and humidity are controlled within the specified range, usually referring to a controllable environment, which has air- conditioning equipment. This group is applicable to precision instruments. Group II: Only the ambient temperature is controlled within the specified range, usually referring to the indoor environment, which has general heat preservation, heating and ventilation. This group is applicable to laboratory instruments. Group III: The ambient temperature and humidity are not controlled, usually referring to the indoor environment, which has no heat preservation, heating and ventilation. This group is applicable to industrial process instruments. Group IV: The harsher environment where the ambient temperature and humidity are not controlled,

usually referring to the outdoor environment with or without shelter. This group is applicable to outdoor use instruments.

2.3 Reference working conditions Refer to Table 2, for reference values, ranges, tolerances of reference working conditions. Under the conditions of no objection, it is allowed to carry out test, at a temperature of 15 °C ~ 25 °C, a relative humidity of 45% ~ 75%, an atmospheric pressure of 86 kPa ~ 106 kPa, a power supply voltage of 220 V ± 22 V, a power supply frequency of

0.5 Hz.

2.4 Test items The test items include 16 items: power supply voltage and frequency test, low temperature test, high temperature test, temperature change test, constant damp heat test, alternating damp heat test, vibration test, magnetic field test, air pressure test, sand dust test, mildew test, salt spray test, low temperature storage test, high temperature storage test, drop test, collision test.

2.5 Selection of grouping of environmental conditions

2.5.1 For the product standards, it shall select the grouping of the environmental conditions in 2.2. If a certain influence quantity (generally only one) is not completely consistent with the environmental conditions of the specified group, it shall be specified separately in the product standard.

2.5.2 When it is not feasible to test the whole machine for a large product, the relevant standards shall provide for the test of those key parts or components.

2.5.3 The test items listed in Table 1 are the items that the instrument shall be subject to. In special circumstances, it shall be according to relevant standards OR negotiated by both the supplier and the buyer.

2.6 Test procedure Each test usually includes the following contents (except for special items):

- a) Pretreatment (if necessary);
- b) Initial testing (if necessary);
- c) Condition test;
- d) Intermediate testing (if necessary); Test the instrument according to relevant standards.

4.4.3 Condition test

4.4.3.1 Put the pre-processed instrument into the test box (chamber), at the normal position, in the non-powered and "ready-to-use" state. At this time, the temperature of the test box (chamber) is consistent with the temperature of the instrument.

4.4.3.2 The temperature of the test box (chamber) is reduced to the specified value, at a rate of change of not more than 1 °C/min (not more than the average value of 5 min). At this time, the instrument is powered on AND maintained for the specified test duration.

4.4.4 Intermediate testing After the duration of the test is reached, the performance test shall be carried out immediately, in accordance with the relevant standards.

4.4.5 Recovery After the testing, cut off the power supply of the instrument, to stop working. The temperature of the test box (chamber) is increased to the environmental conditions of the instrument during the pretreatment, at a rate of change of not more than 1 °C/min. After reaching the temperature, it will be restored for 1 h ~ 2 h.

4.4.6 Final testing Test the instrument according to relevant standards.

4.5 Information to be given by relevant standards When the relevant standards adopt this method, it shall give the following detailed rules as applicable as possible:

- a) Pretreatment;
- b) Initial testing items and requirements;
- c) The duration of test;
- d) Intermediate testing items and requirements;
- e) Final testing items and requirements;
- f) Any changes to the test procedure, as agreed by the supplier and the buyer. The duration of the instrument temperature test shall be selected from the following: 2 h, 4 h, 8 h, 16 h.

5.4 Test procedure

5.4.1 Pretreatment Place the instrument under normal (or reference) environmental conditions, to achieve temperature equilibrium.

5.4.2 Initial testing Test the instrument according to relevant standards.

5.4.3 Condition test

5.4.3.1 Put the pre-processed instrument into the test box (chamber), at the normal position, in the non-powered and "ready-to-use" state. At this time, the temperature of the test box (chamber) is consistent with the temperature of the instrument.

5.4.3.2 The temperature of the test box (chamber) is increased to the specified value, at a rate of change of not more than 1 °C/min (not more than the average value of 5 min). At this time, the instrument is powered on AND maintained for the specified test duration.

5.4.4 Intermediate testing After the duration of the test is reached, the performance test shall be carried out immediately, in accordance with the relevant standards.